204

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ST.
COLORADO

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 195

Arvin Models 6213TM, 6215CB, CM (Ch. TE-319) are covered in Photofact Folder 4, Set 195. Model 6213TB has, also, been added which is identical to Model 6213TM, except, for a blond cabinet.

In later production of Ch. TE-319, the following changes were made.

Ch. TE-319-1

Ch. TE-319-1 is electrically identical to Ch. TE-319 except for the following:

TO ELIMINATE REGENERATION IN THE AGC CIRCUIT

A 1000MMF capacitor was added from the junction of R37 and R39 to ground.

TO INCREASE THE RANGE OF THE HEIGHT CONTROL

R86 was changed from 1Meg to 1.5Meg.

TO INCREASE THE RANGE OF THE HORIZONTAL HOLD CONTROL

R100 changed from 91KΩ to 100KΩ.

R3 (Horiz. Hold Control) changed from 25KΩ to 50KΩ.

TO CHANGE THE PEAKING RANGE IN THE VERTICAL CIRCUIT

R89 changed from 10KΩ to 12KΩ.

TO REDUCE PEAK CURRENT DRAWN FROM THE 5U4, LOW VOLTAGE RECTIFIER

R110 and C2B were omitted and the fuse (M1) connected directly to 310 volts.

C2B reconnected in series with C4 and returned to ground instead of 310 volts.

A 100Ω, 30 watt, resistor (part #40615) was added between pin 8 of V21 (5U4) and the junction of C1A, R116 and L1.

COMPONENT CHANGES REQUIRED AS THE RESULT OF THE ADDITION OF THE 100Ω RESISTOR

R53 changed from 3300Ω to 470Ω.

R106 changed from 220Ω to 50Ω.

R115 changed from 15KΩ to 6.8KΩ.

R116 changed from 2200Ω to 1800Ω.

Ch. TE-319-2

Chassis TE-319-2 is identical to Ch. TE-319-1 except for the following:

TO REDUCE SMEARING AND RINGING

The video peaking coil, L31, was changed from 250 microhenries, wound on a 16KΩ resistor, to 250 microhenries wound on a 4.3KΩ resistor.

L33 was changed from 185 microhenries to a 500 microhenry coil, wound on a 10KΩ resistor.

PICTURE TUBE CHANGED

The picture tube was changed from a 21MP4 to a 21AP4.

The Ion trap (M6) was changed to part #C25662-3.

The centering magnet (M5) was deleted and a PM focus unit (part #C23910-2) was added.

TO IMPROVE VERTICAL NOISE IMMUNITY

A 6C4 noise limiter stage was added in Ch. TE-319-2. A partial schematic showing the new circuit is given on the reverse side.

R73, V13 grid load resistor, was also changed from 2.2Meg to 4.7Meg.

ARVIN MODELS 6213TB, TM, 6215CB, CM (Ch. TE-319, -1, -2)

PRODUCTION CHANGES
BULLETIN 67

PRODUCTION CHANGES
BULLETIN 67

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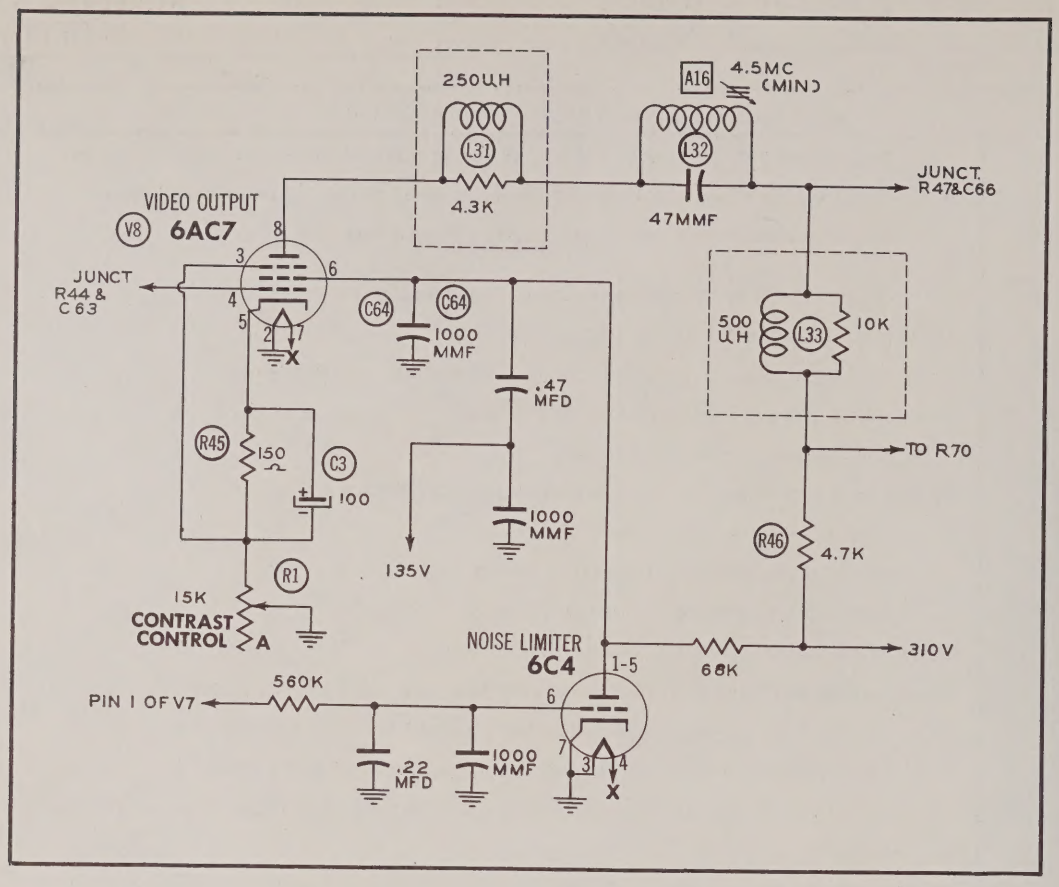
250µH
L31
4.3K
A16
4.5MC (MIN)
L32
47MMF
JUNCT. R47&C66
VIDEO OUTPUT
V8
6AC7
JUNCT R44 & C63
C64
1000 MMF
.47 MFD
500 µH
L33
10K
TO R70
R45
150
C3
100
1000 MMF
135V
R46
4.7K
R1
15K
CONTRAST CONTROL
A
NOISE LIMITER
6C4
1-5
68K
310V
560K
PIN 1 OF V7
.22 MFD
1000 MMF
X

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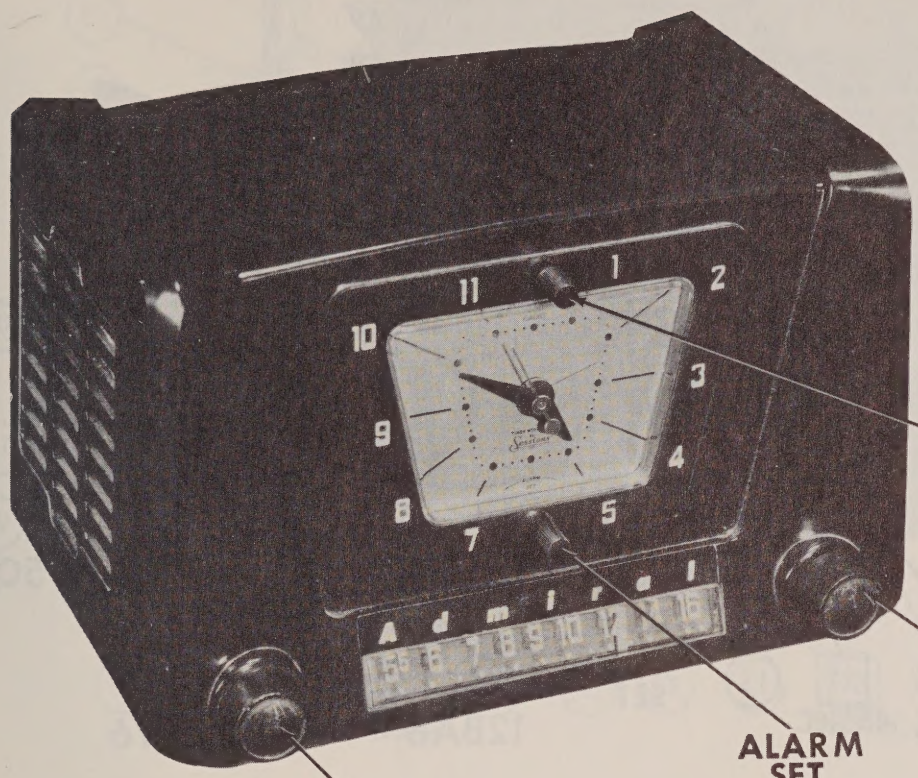
ADMIRAL
CHASSIS 5X2



ADMIRAL
CHASSIS 5X2

ADMIRAL MODEL 5X22

TRADE NAME	Admiral Models 5X21, 5X22, 5X23 (Ch. 5X2)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (FIVE)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .26 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn tuning gang fully closed and set left edge of pointer saddle at hole in left end of dial back plate.
Use isolation transformer, if available. If not, connect a .IMFD capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screw driver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	250MMF	High Side to antenna stator of tuning gang. Low side to B-.	455KC (400Ω mod)	Tuning gang fully open.	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	"	Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	70	150	67A17-1	PRS150/40-40-		BRD8415		3N536	TVA-2460	Red
B	30	150		40						Yellow
C2	.05	400	64B1-7	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	47		65C6-79	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C4	.1	200	64B1-5	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C5	220		65C6-80	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C6	.01	400	64B1-10	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C7A	.005									
B	250		♦63A5-4		♦PC-70		♦1406-01		♦104C4	
C										
C8	.02	400	64B1-9	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C9	.25	200	64B1-3	PTE4P25		PTE4P25		PT4025	2TM-P25	Note 1
C10	.047	400	65A13-5	489ZX-05		PJ4S47		PT4147	4TM-S47	
C11	.1	200	64B1-5	P288-1		PJ2P1		PT401	2TM-P1	

Note 1. Early production sets use 4MFD electrolytic in this application (Part #65A4-2)

♦ Items C7A, C7B, C7C, R6A, R6B are combined in one unit.
When replacing items separately C7B and C7C should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	75B1-51	Q13-137	AG-63-Z	BSK-70	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R2	22KΩ	½	60B8-223	BTS-22K	
R3	100Ω	½	60B8-101	BTS-100	
R4	1 Meg	½	60B8-105	BTS-1 Meg	
R5	4.7Meg	½	60B8-475	BTS-4.7Meg	
R6A	500KΩ	½	♦ 63A5-4		
B	500KΩ	½			

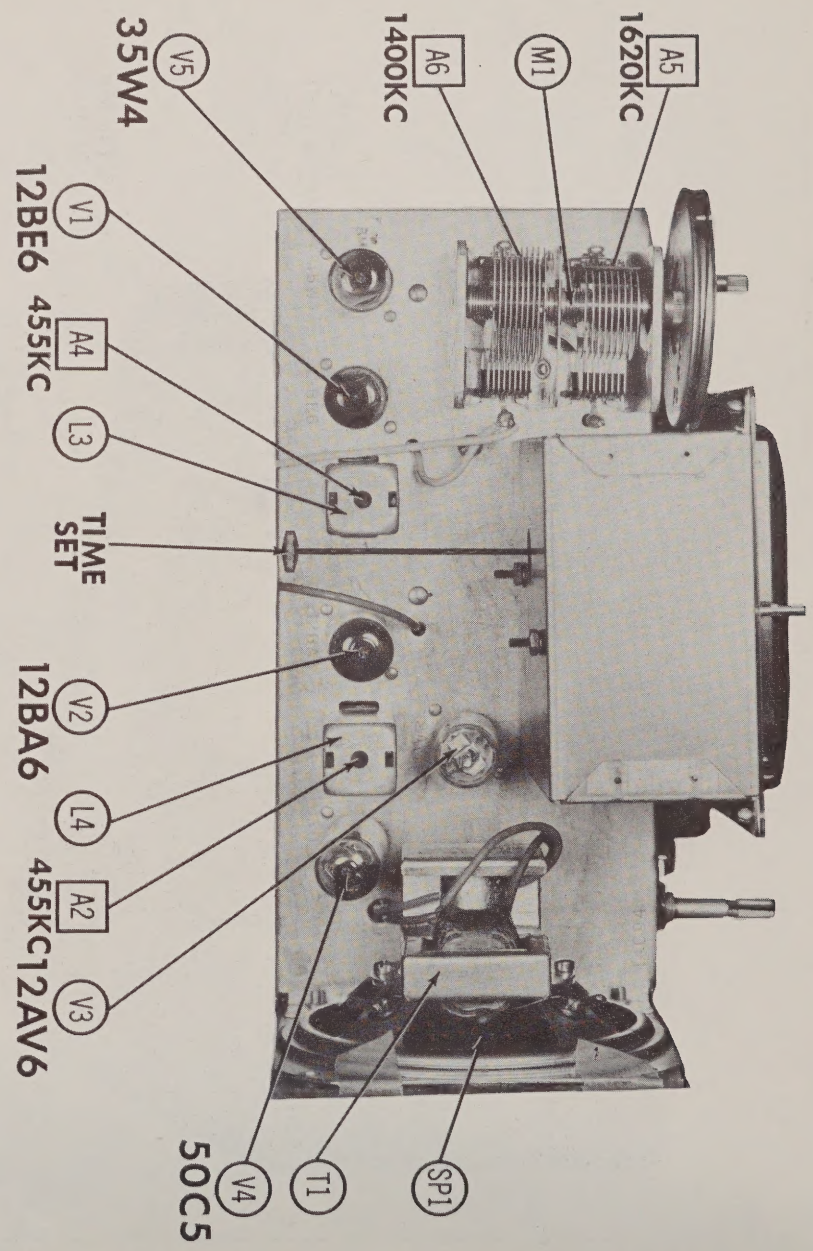
♦ Items R6A, R6B, C7A, C7B, C7C are combined in one unit.

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R7	47KΩ	½	60B8-473	BTS-47K	
R8	150Ω	½	60B8-151	BTS-150	
R9	33Ω	1	60B28-3		
R10	560Ω	2	60B20-561	BTB-560	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2.1KΩ	3.5Ω	150Ω	.61Ω	Part of Spkr.	A-3332 ①	A-3025 ①	RO-2 ①	S-2X ①	① Bend mounting down, file out slots, mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.5Ω	78B65-3	ST-113 Mod. P4-X	4A07	

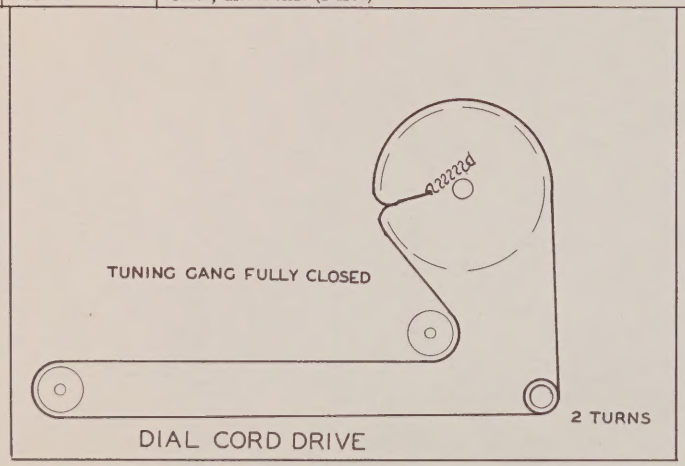
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	ADMIRAL PART No.	MILLER PART No.	MEISSNER PART No.	
L1	Loop Ant.	.2Ω		69C157			
L2	Osc. Coil	6.5Ω		69A52-4	71-OSC *		Tapped @ .8Ω
L3	Input IF	17Ω	17Ω	72B28-7	12-C1	16-6758	
L4	Output IF	17Ω	17Ω	72B28-7	12-C2	16-6758	

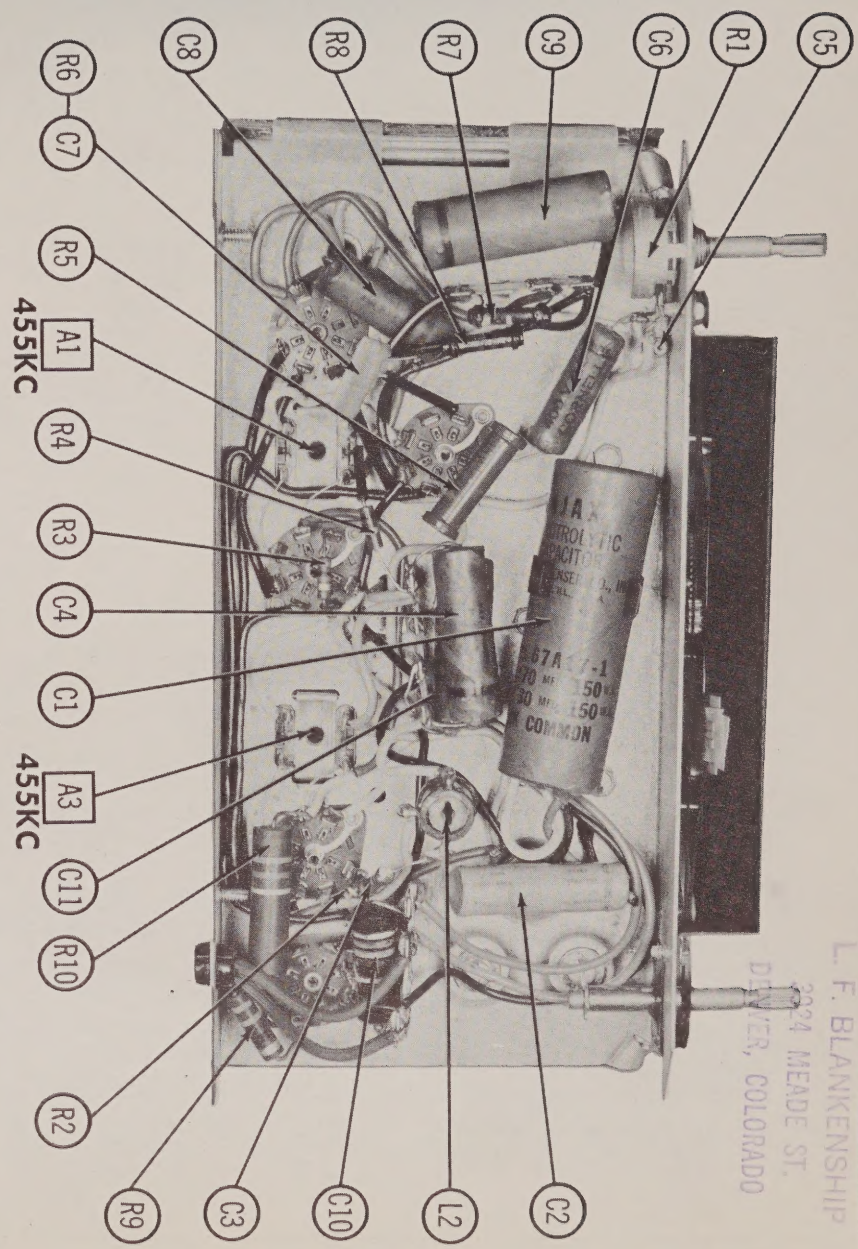
* Drill mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M1	Tuning Capacitor	68B51	28-330MMF, 19-125 MMF.
	Clock	91C8-1	For 60 Cycles, Complete.
	Clock	91C8-2	For 50 Cycles, Complete.
	Switch	91C6-16	On/Off Auto Switch.
	Cabinet	34D55-1	Ebony, Model 5X21
	Cabinet	34D55-2	Mahogany, Model 5X22.
	Cabinet	34D55-3	Ivory, Model 5X23.
	Escutcheon	21B63	
	Background (Dial)	15B840	
	Pointer	25A49-2	
	Window (clock)	24B12	
	Knob	33A81-1	Volume, Tuning, Model 5X21 (2 used)
	Knob	33A81-3	Volume, Tuning, Model 5X22 (2 used)
	Knob	33A81-2	Volume, Tuning, Model 5X23 (2 used)
	Knob	91C8-11	Clock, Model 5X21 (2 used)
	Knob	91C8-12	Clock, Model 5X22 (2 used)
	Knob	91C8-13	Clock, Model 5X23 (2 used)



CHASSIS—BOTTOM VIEW



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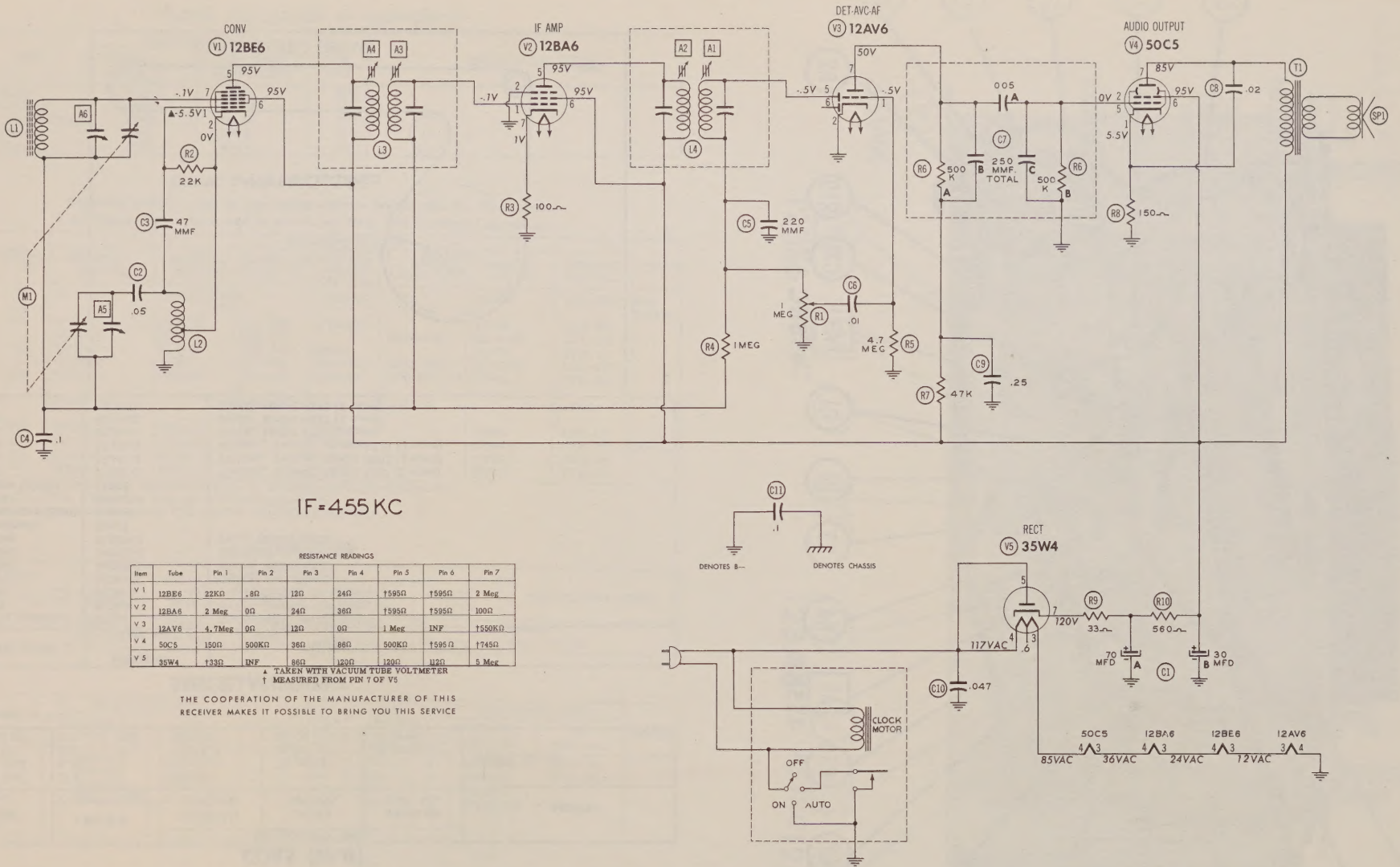
ADMIRAL
MODEL 5X21 (Ch. 5X2)



IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.8Ω	12Ω	24Ω	†595Ω	†595Ω	2 Meg
V 2	12BA6	2 Meg	0Ω	24Ω	36Ω	†595Ω	†595Ω	100Ω
V 3	12AV6	4.7Meg	0Ω	12Ω	0Ω	1 Meg	INF	†550KΩ
V 4	50C5	150Ω	500KΩ	36Ω	86Ω	500KΩ	†595Ω	†745Ω
V 5	35W4	†33Ω	INF	86Ω	120Ω	120Ω	112Ω	5 Meg

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

ANDREA MODELS C-VM21, CO-VM21, T-VM21, 2C-VM21 (Ch. VM21)

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DENVER, COLORADO

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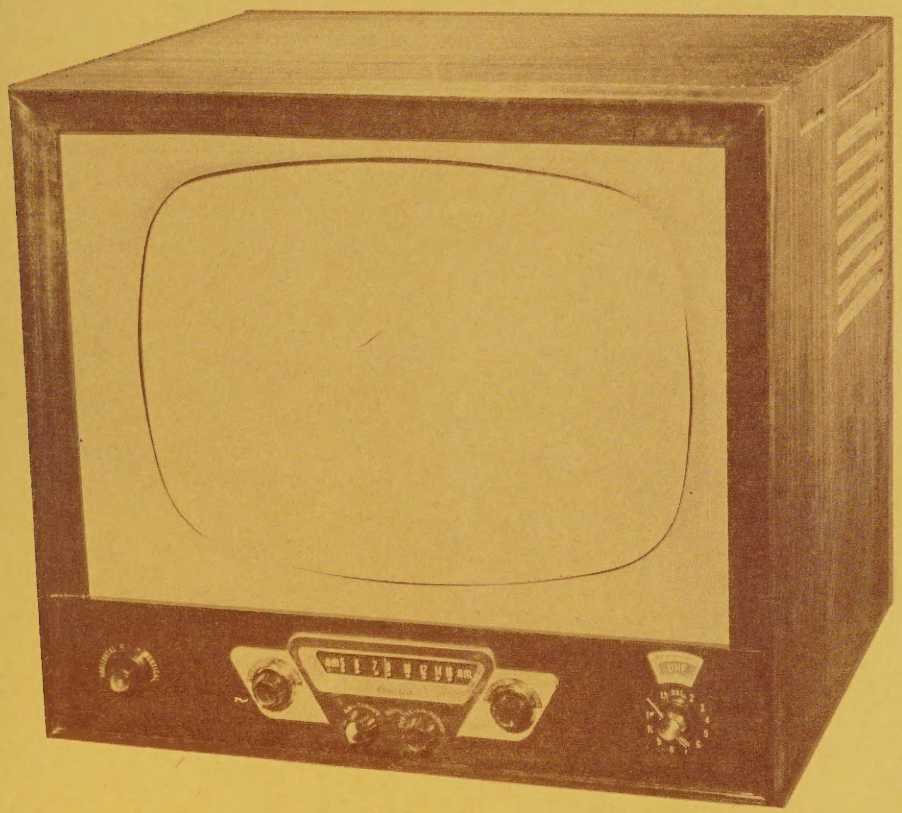
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL T-VM-21

ANDREA MODELS C-VM21, CO-VM21, T-VM21, 2C-VM21 (Ch. VM21)

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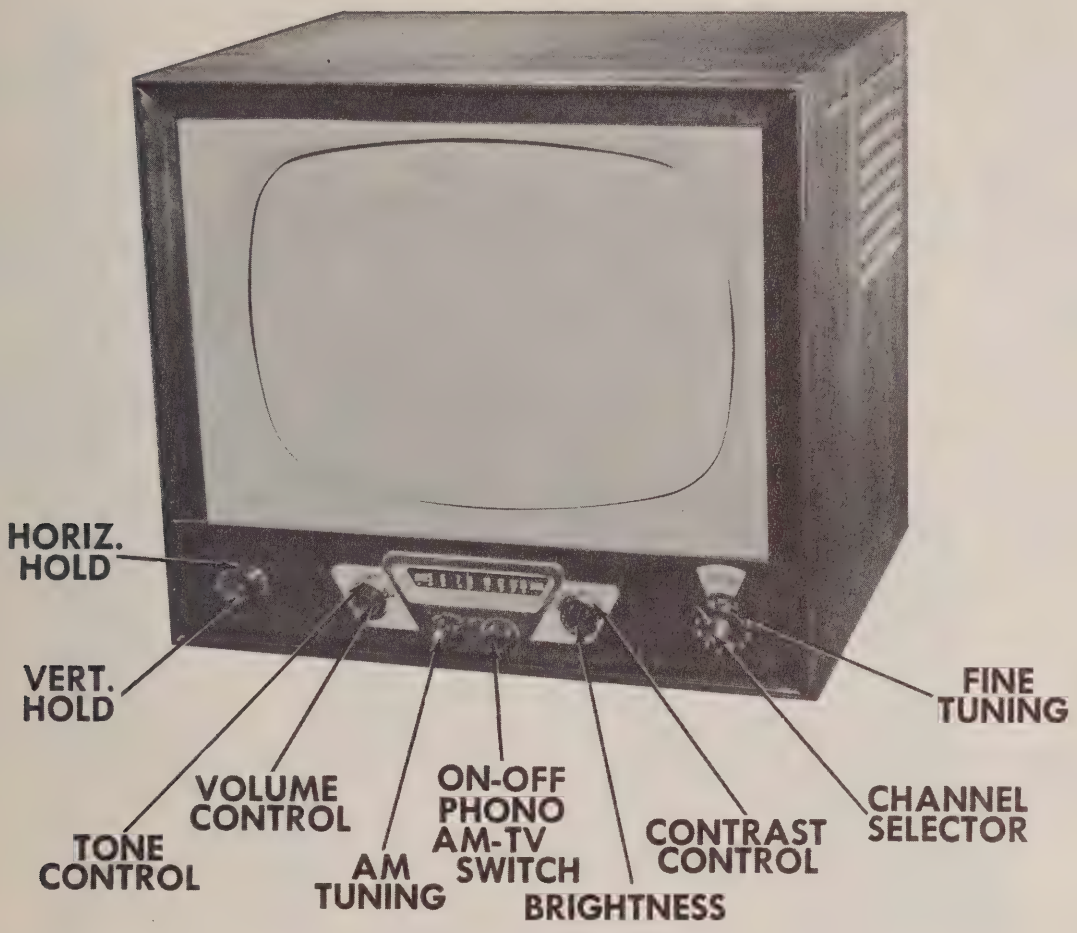
DATE 5-53 · SET 204 FOLDER 3

ANDREA MODELS C-VM21, CO-VM21, T-VM21, 2C-VM21 (Ch. VM21)



ANDREA MODEL T-VM-21

TRADE NAME	Andrea Models C-VM-21, C0-VM-21, T-VM-21, 2C-VM-21 (Ch. VM21).
MANUFACTURER	Andrea Radio Corp., 27-01 Bridge Plaza North, Long Island City, New York
TYPE SET	Television Receiver with Built-in AM Radio
TUBES	Twenty-Six
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.16 Amp. @ 117Volts AC
TUNING RANGE—	TV Channels 2 thru 13, Video IF 45.75MC, TV Sound IF 41.25MC (Intercarrier) AM Radio 540-1620KC AM IF 455KC

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DATE 5 -53 SET 204 FOLDER 3

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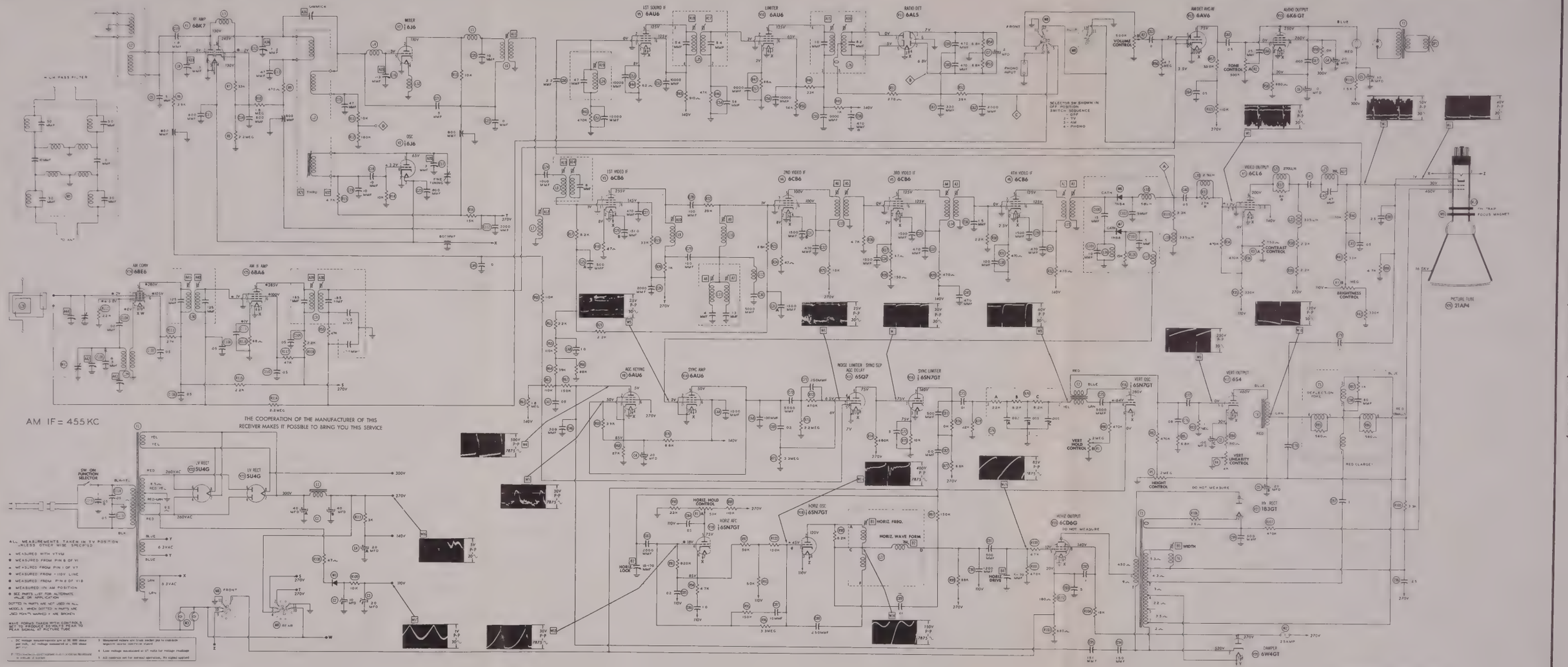
AM IF = 455 KC
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
ALL MEASUREMENTS TAKEN IN TV POSITION UNLESS OTHER WISE SPECIFIED
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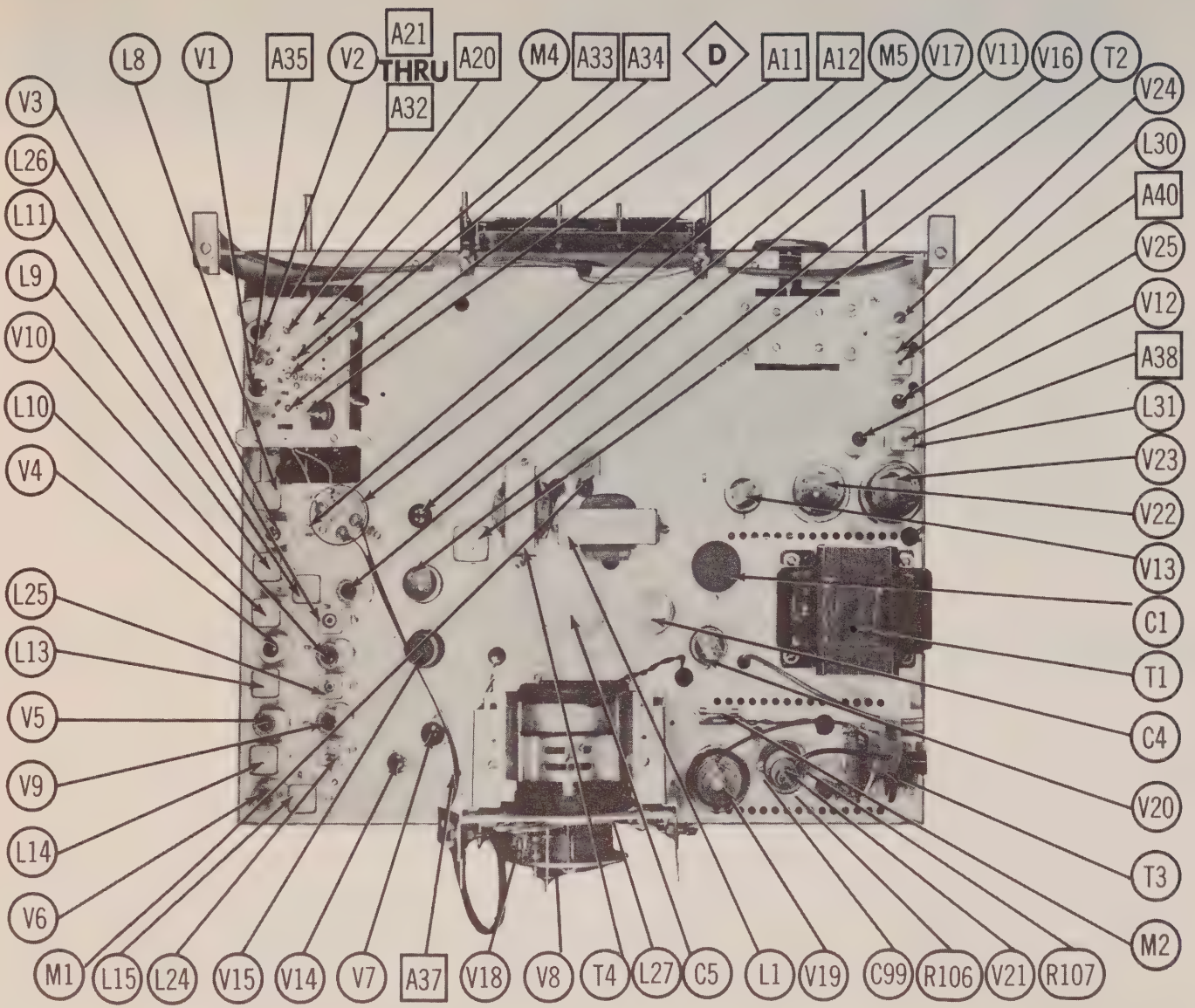
ANDREA MODELS C-VM21, CO-VM21, T-VM21, 2C-VM21 (Ch. VM21)



CHASSIS TOP VIEW

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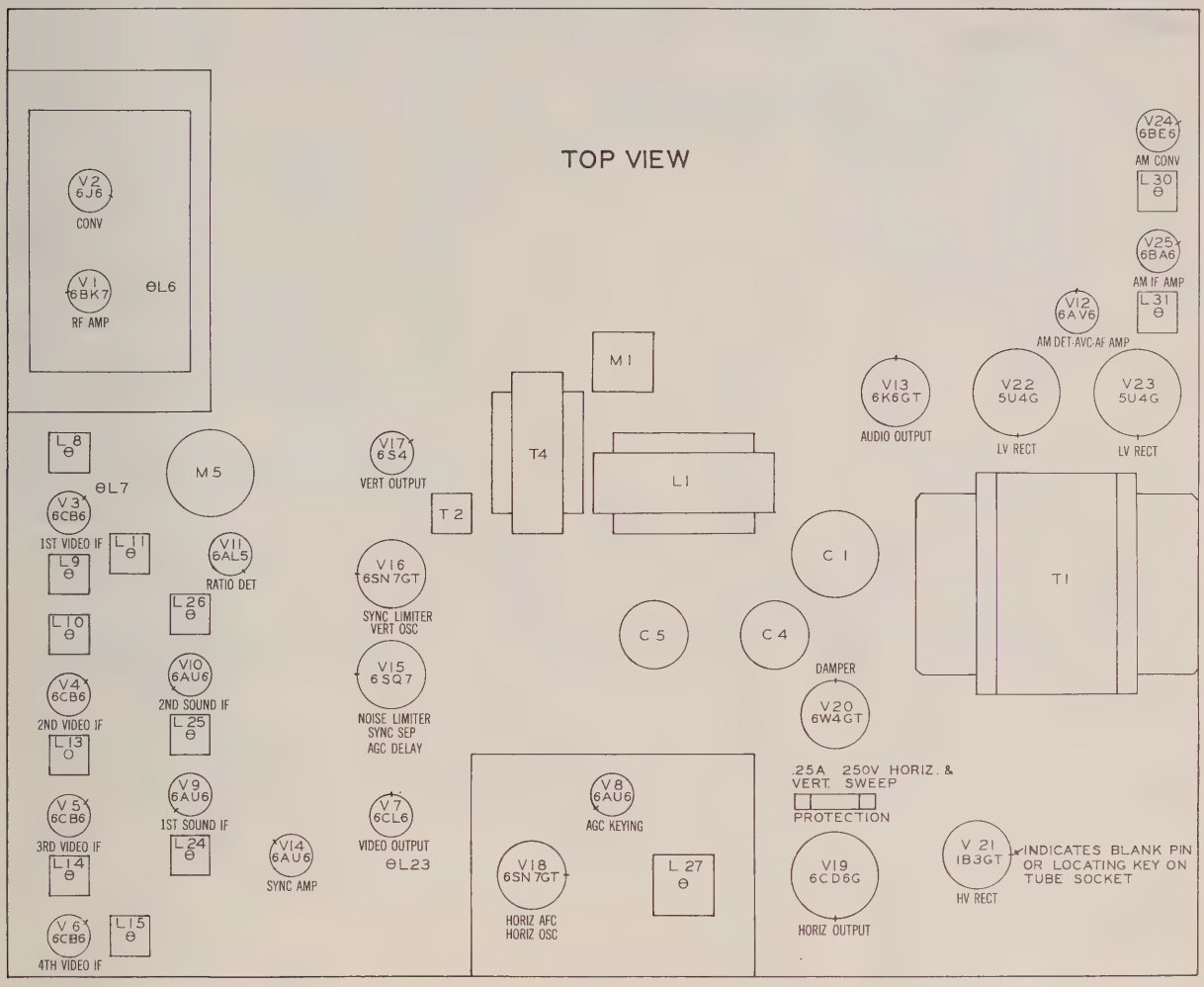
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V22, V23.

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V7, V26
Has pic, no sound-V9, V10, V11, V12, V13
Overloaded picture -V8

SYNC FAILURE
No vert. sync-V16
No horiz. sync-V16, V18
No vert. or horiz. sync-V14, V15, V16

SWEEP FAILURE
No raster, has sound-V18, V19, V20, V21, V26 Fuse M2
No vertical deflection-V16, V17
Poor vert. linearity or foldover-V16, V17
Poor horiz. linearity or foldover-V18, V19, V20
Narrow picture-V18, V19, V20, V21, V22, V23
Vert. off freq.-V16
Horiz. off freq.-V16, V18

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube (V18) from its socket.

VIDEO IF ALIGNMENT

Connect the negative lead of a 7 volt bias supply to the junction of R62 and R65. Connect the positive lead to chassis.
Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 6CB6 (V6). Low side to chassis.	43MC (10MC Swp)	42.5MC 45.75MC	Any	Vert. amp to point (A) Low side to chassis.	A1, A2	Connect plate to screen (pin 5 to 6) of V5. Adjust for response similar to Fig. 1. Attenuate generator to maintain 2 Volt peak at point (A).
2.	"	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	"	"	"	"	A3, A4	Disconnect plate from screen of V5. Connect plate to screen (pin 5 to 6) of V 4. Adjust for response similar to Fig. 1.
3.	"	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	"	"	"	"	A5, A6	Disconnect plate from screen of V14. Adjust for response similar to Fig. 2.
4.	"	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	"	41.25MC 47.25MC 42.5MC 45.75MC	"	"	A7, A8, A9, A10	Adjust A7 for proper response at 41.25MC as in Fig. 3. Adjust A8 for response at 47.25MC, A9 and A10 for overall response as in Fig. 3.
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	"	39.75MC 41.25M C 42.5MC 45.25MC 45.75MC 47.25MC	"	"	A11, A12, A13, A14	Adjust for response similar to Fig. 4. A14 affects response at 39.75MC.

SOUND IF ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin (grid) of 6AU6 (V10). Low side to chassis.	4.5MC (150KC Swp)	4.45MC 4.475MC 4.5MC 4.525MC 4.55MC	Any	Vert. Amp. to point (B). Low side to chassis.	A15	Disconnect stabilizer capacitor C7. Adjust for response similar to Fig. 5.
7.	"	"	"	4.5MC	"	Vert. Amp. to point (C). Common to chassis.	A16	Reconnect capacitor C7. Adjust for response similar to Fig. 6.
8.	"	High side to pin 1 (grid) of 6AU6 (V9).	"	4.45MC 4.475MC 4.5MC 4.525MC 4.55MC	"	Vert. Amp. to point (B). Low side to chassis.	A17 A18	Disconnect capacitor C7. Adjust for response similar to Fig. 7.
9.	"	High side to point (A). Low side to chassis.	"	4.45MC 4.475MC 4.5MC 4.525MC 4.55MC	"	"	A19	Adjust for response similar to Fig. 8.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the 7 volt bias supply as under video IF alignment.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A20.
It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel.
If adjustment of A20 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the upper right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Set the fine tuning control at the center of its range (the flat of the fine tuning shaft will be uppermost).
Disconnect the high pass filter from the tuner during alignment and connect the sweep generator directly to tuner through matching network.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across tuner input terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A21	Adjust to place video marker at 50% on low frequency side of response curve as in Fig. 9.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A22	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A23	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A24	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A25	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A26	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A27	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A28	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A29	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A30	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A31	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A32	

TV ALIGNMENT INSTRUCTIONS (CONT.)

PROPERTY OF
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RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt battery to the AGC lead of the tuner (white-red lead). Connect the positive lead to chassis.

Disconnect the high pass filter from the tuner during alignment and connect the sweep generator directly to tuner through matching network.

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across tuner input terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp thru 10KΩ to point D Low side to chassis.	A33, A34, A35, A36	Adjust for response similar to Fig. 10. A36 is a coupling gimmick and effects principally the high channels.
12.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response as in Fig. 10. If necessary make compromise adjustments of A33 thru A36 to correct any individual channel. Recheck all other channels to see that they have not been seriously affected. A33 affects principally the sound and video carriers on low frequency channels A34 affects the video carrier on high channels. A35 affects the sound carrier on high frequency channels.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	59.25MC 59.75MC	2			

4.5MC TRAP ALIGNMENT

Tune TV set to a TV test pattern and adjust A37 for maximum vertical wedge definition.

FIG.1

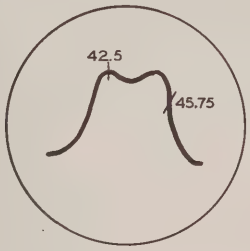


FIG.2

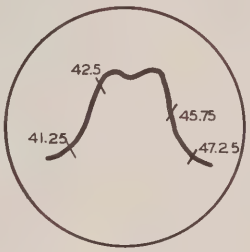


FIG.3

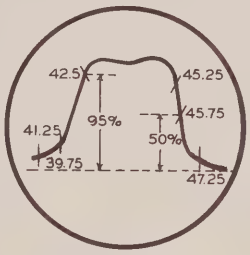


FIG.4

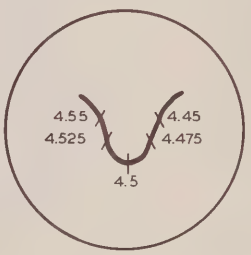


FIG.5

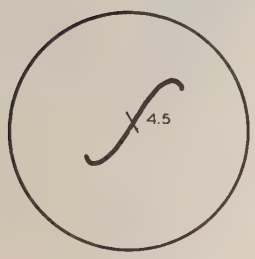


FIG.6

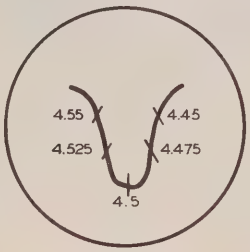


FIG.7

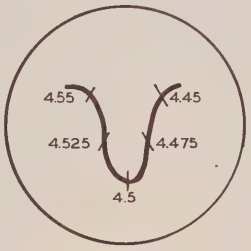


FIG.8

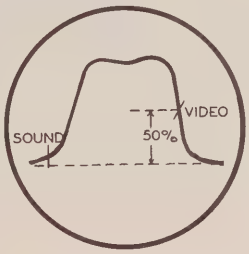


FIG.9

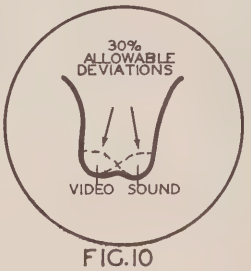


FIG.10

RADIO ALIGNMENT INSTRUCTIONS

RADIO ALIGNMENT

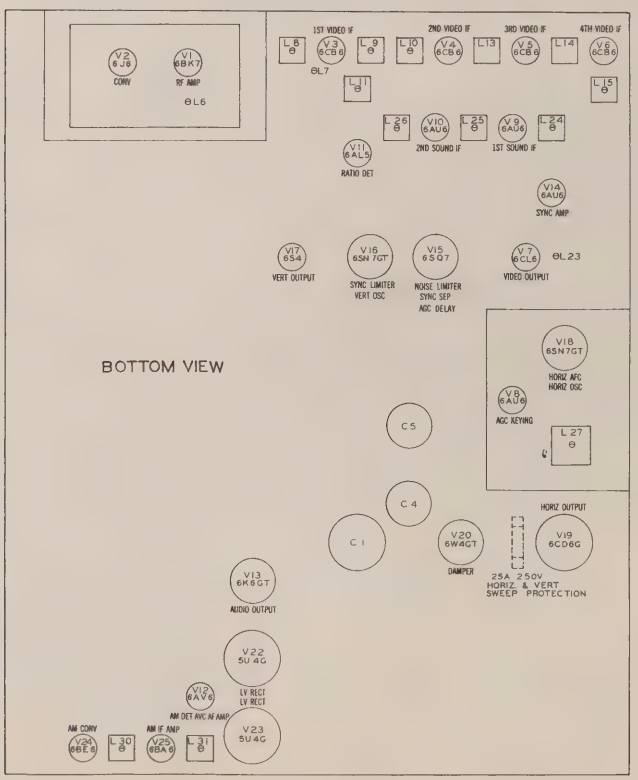
Turn the tuning gang fully closed and set pointer approximately 3/16" to left of last index mark at low frequency end of dial. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
13.	.1MFD	High side to pin 7 (grid) of 6BE6 (V24). Low side to chassis.	455KC (400∿Mod)	Radio	Tuning gang fully open	Across voice coil	A38, A39, A40, A41	Adjust for maximum output.
14.	"	"	1620KC	"	"	"	A42	"
15.		Loop	600KC	"	Tune to 600KC signal	"	A43	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum while rocking tuning gang. Repeat steps 14 and 15 until no further improvement is noted, making final adjustment with A42.
16.		"	1400KC	"	Tune to 1400KC signal	"	A44	Adjust for maximum output.

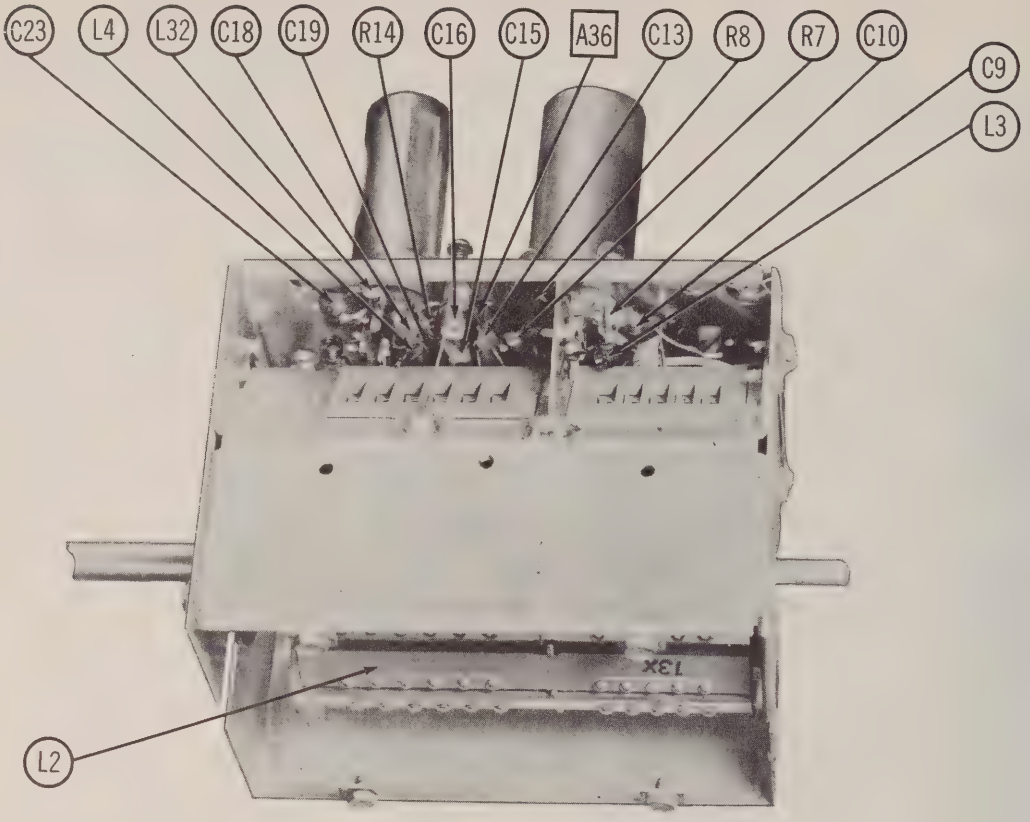
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	†1.8Meg	260KΩ	0Ω	.1Ω	0Ω	†570Ω	†1.8Meg	†1.8Meg	0Ω
V 2	6J6	†20KΩ	†25KΩ	.1Ω	0Ω	190KΩ	10KΩ	0Ω		
V 3	6CB6	190KΩ	47Ω	0Ω	.1Ω	†1KΩ	†35KΩ	0Ω		
V 4	6CB6	190KΩ	47Ω	0Ω	.1Ω	†10KΩ	†10KΩ	0Ω		
V 5	6CB6	1.6Ω	197Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 6	6CB6	1.2Ω	470Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 7	6CL6	720Ω	950Ω	†3KΩ	0Ω	.1Ω	†4.4KΩ	0Ω	3KΩ	650KΩ
V 8	6AU6	30KΩ	27KΩ	0Ω	.1Ω	260KΩ	†100Ω	27KΩ		
V 9	6AU6	470KΩ	0Ω	.1Ω	0Ω	†3.9KΩ	†3.9KΩ	82Ω		
V 10	6AU6	47KΩ	0Ω	.1Ω	0Ω	†4KΩ	†25KΩ	68Ω		
V 11	6AL5	6.8KΩ	6.8KΩ	0Ω	.1Ω	500KΩ	0Ω	500KΩ		
V 12	6AV6	4.7Meg	0Ω	0Ω	.1Ω	◓550KΩ	◓550KΩ	†440Ω		
V 13	6K6GT	0Ω	0Ω	†1.5KΩ	†10KΩ	500KΩ	20Ω	.1Ω	680Ω	
V 14	6AU6	15KΩ	0Ω	.1Ω	0Ω	†14KΩ	†3KΩ	0Ω		
V 15	6SQ7	0Ω	2.6Meg	0Ω	3.3Meg	170KΩ	†680KΩ	0Ω	.1Ω	
V 16	6SN7GT	†680KΩ	†17KΩ	10KΩ	470KΩ	♦480KΩ	0Ω	.1Ω	0Ω	
V 17	6S4	INF	3.1KΩ	1 Meg	0Ω	.1Ω	1 Meg	INF	INF	♦5.1KΩ
V 18	6SN7GT	‡310KΩ	†68KΩ	‡10KΩ	‡1.1 Meg	†42KΩ	‡310KΩ	.1Ω	0Ω	
V 19	6CD6G	■47KΩ	.1Ω	180Ω	INF	475KΩ	860Ω	0Ω	†18KΩ	Top Cap ♦19Ω
V 20	6W4GT	INF	INF	400KΩ	INF	†100Ω	INF	♦28Ω	♦28Ω	
V 21	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ♦469Ω
V 22	5U4G	INF	25KΩ	INF	19.6Ω	INF	18.6Ω	INF	25KΩ	
V 23	5U4G	INF	25KΩ	INF	19.6Ω	INF	18.6Ω	INF	25KΩ	
V 24	6BE6	◓22KΩ	4.5Ω	◓.1Ω	0Ω	◓†2.2KΩ	◓†30KΩ	◓2.9Meg		
V 25	6BA6	◓2.9Meg	0Ω	◓.1Ω	0Ω	◓†2.2KΩ	◓†49KΩ	68Ω		
V 26	21AP4	0Ω	465KΩ	Pin 10 ♦3.5KΩ	Pin 11 4.7KΩ	Pin 12 .1Ω				

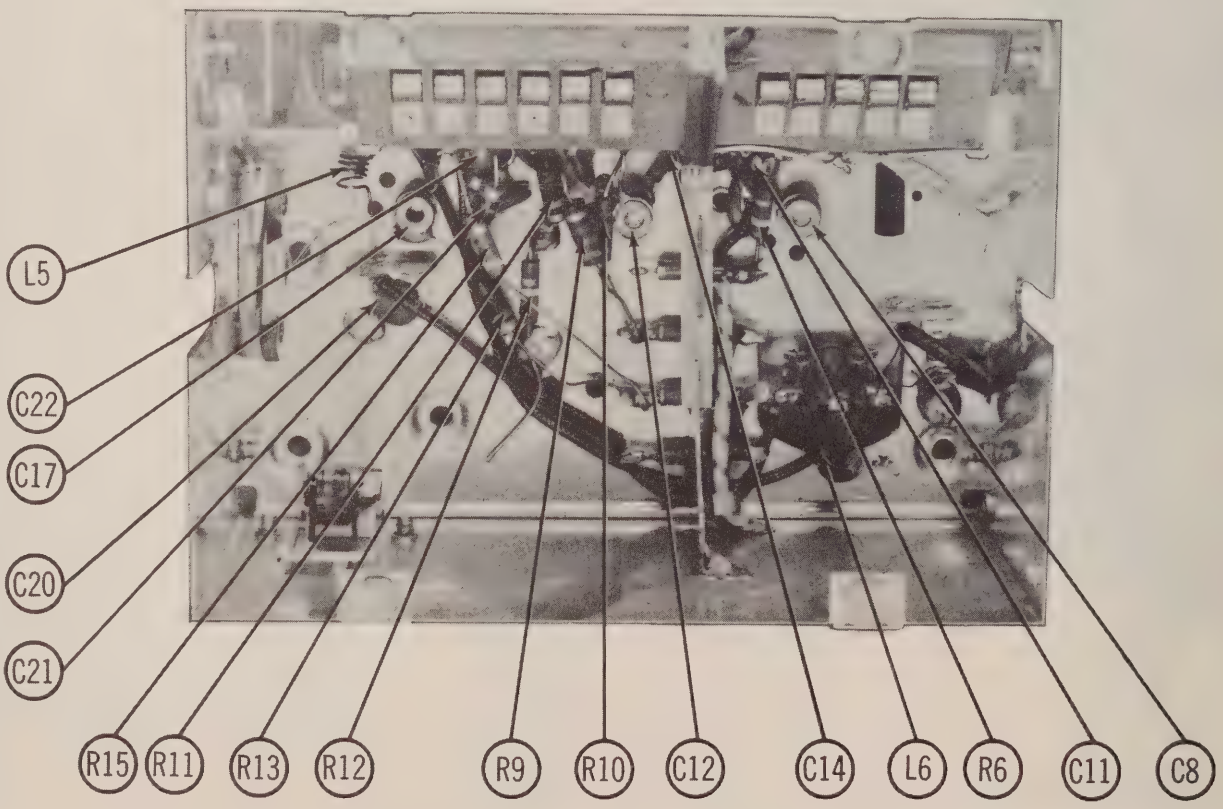
† MEASURED FROM PIN 2 OF V23
♦ MEASURED FROM PIN 3 OF V20
■ MEASURED FROM PIN 5 OF V19
‡ MEASURED FROM OUTPUT OF M1
◓ MEASURED WITH FUNCTION SELECTOR IN AM POSITION
ALL MEASURED WITH FUNCTION SELECTOR IN TV POSITION UNLESS NOTED



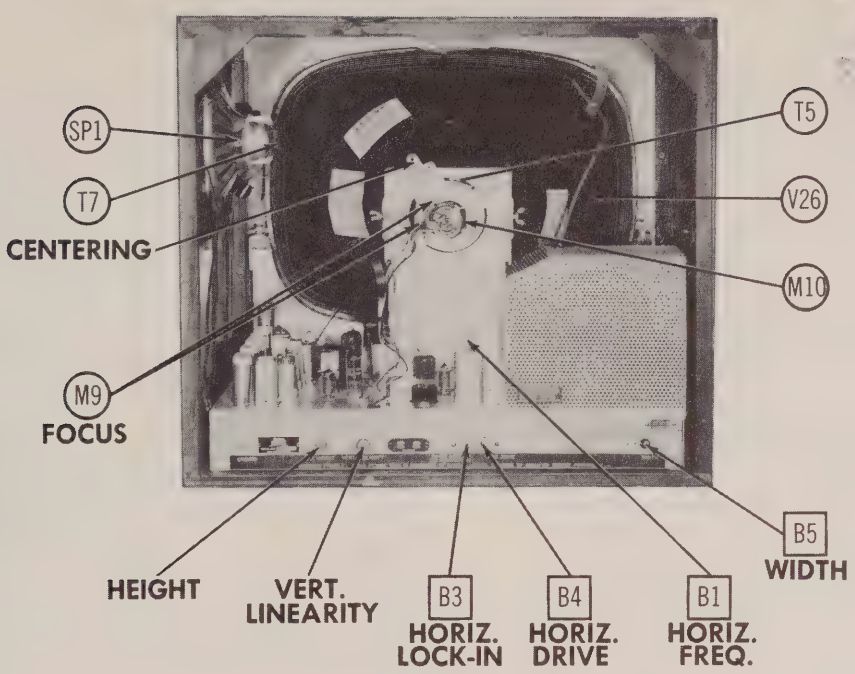
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to the mid-position of its range.

Set the horizontal lock trimmer (B3) to 1/4 turn from fully clockwise.

Set the horizontal drive trimmer (B4) to 1/4 turn from fully clockwise.

Set the horizontal waveform slug (B2) 3 turns from full counter clockwise position.

Set the horizontal frequency slug (B1) so that 1 inch of screw protrudes from the can.

Connect the low capacity probe of an oscillloscope to terminal "C" of L27, low side of scope to chassis.

Adjust B1 for a decreasing number of diagonal bars in picture until picture locks into sync.

If broad and sharp peaks of waveform on scope become more than 15% unequal, reset B2 to minimize the difference.

Adjust the width slug (B5) and B4 for a picture of proper width and linearity.

Adjust B2 so that the broad and narrow peaks of the waveform on scope are of equal height as in Fig. 11 .

Keep picture in sync during this adjustment by means of the horizontal hold control.

Turn the horizontal hold control fully counter clockwise and adjust B1 in clockwise direction to the point just before horizontal sync becomes unstable.

Momentarily switch to another channel and back again, throwing the picture out of sync.

Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars present just before sync pull-in. If more than 3 bars are present turn the horizontal lock trimmer, B3, clockwise. If less than 3 bars are present turn B3 counter clockwise.

Repeat the check of sync pull-in and adjust B3 until 3 bars are present at pull-in point.

Back off B1 slightly in counter clockwise direction so that sync range of the horizontal hold control is properly centered.

The horizontal drive trimmer should not be readjusted unless either of the following conditions are noted:

1. White vertical lines occur in the center of the picture. Adjust B4 clockwise until lines disappear.
2. Insufficient width. Adjust B4 counter clockwise.

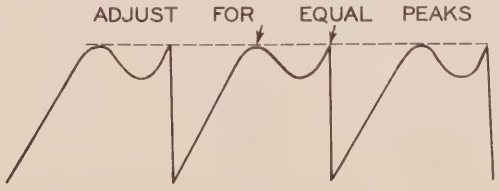


FIG. 11

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See LOSS OF HIGH VOLTAGE

INSUFFICIENT SWEEP

Check by substitution V18, V19 and V21. Check waveform W15.

If Insufficient	If Sufficient
Check drive control. Check components of V18.	Check width control by substitution. Check T3, T5A and associated components.

DRIVE LINES

Substitute V19 and check coupling network between V18 and V19.

COMPRESSED AT LEFT SIDE

Substitute V19 and V20. Check components of horizontal output and damper circuits.

FOLDS

Substitute V20 and check T3, T5A and associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V16 and V17. Check waveform W9.

If Unsatisfactory	If Satisfactory
Check T2 and associated components. Check coupling network between V16 and V17.	Check T4, T5B and associated components.

INSUFFICIENT SWEEP

If substitution of V16 and V17 does not correct trouble follow procedure outlined under LOSS OF SWEEP.

COMPRESSED AT BOTTOM

Check C77 for leaky condition. Check C5 (B&C) for open.

COMPRESSED AT TOP AND STRETCHED AT BOTTOM

Check components of coupling and waveshaping network.

FOLDS

Substitute V17 and check C5 (B&C) for open .

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V14, V15, V16 and V18. Check waveform W12.

If Unsatisfactory	If Satisfactory
Check waveforms W3, W6 and W7. Check components of stage where signal is lost or distorted.	Check components of V18, particularly L27 and C89.

CRITICAL HOLD

Substitute V14, V15, V16 and V18. If no change is noticed, follow procedure outlined under LOSS OF SYNC.

PULLING PICTURE

Substitute V16 and V18. Check coupling networks between V16 and V18, and between V18 and V19.

VERTICAL

LOSS OF SYNC

Substitute V14, V15, V16 and V17. Check waveform W8.

If Unsatisfactory	If Satisfactory
Check components of V15 and V16A. Check components of integrator.	Check components of V16B.

CRITICAL SYNC

Follow procedure outlined under LOSS OF SYNC.

TRIGGERING

Substitute V16 and check circuit components.

VIDEO

SOUND BARS

Check adjustment of A37 ($4\frac{1}{2}$ MC Trap). Check adjustment of local oscillator and alignment of IF stages.

POOR RESOLUTION

Check alignment of tuner and IF stages. Substitute V7 and check associated components.

SMEAR

Substitute V7 and check circuit components.

ONE WIDE BLACK BAR ACROSS PICTURE

Check tuner, Video IF and video amplifier tubes for filament to cathode leakage.

POOR CONTRAST

Check by substitution, tuner and video IF tubes. Check waveform W2.

If Unsatisfactory	If Satisfactory
Substitute V7, V8 and V15. Check associated components.	Check cathode circuit of picture tube. Check picture tube.

AUDIO

WEAK OR NO SOUND

Substitute V9, V10, V11 and V13. Check coupling capacitor C50 and other circuit components. Check video IF alignment.

BUZZ

Adjust discriminator secondary for minimum buzz. Substitute V11. Check local oscillator setting. Check for overloading at waveform W1. If overloading exists, check AGC network.

DISTORTED

Check audio stage using audio signal generator and scope.

If Undistorted	If Distorted
Check alignment of sound IF and discriminator.	Substitute V13 and check circuit components.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ANDREA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BK7	6BK7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	6CL6	6CL6		
V8	AGC Keying	6AU6	6AU6	7BK	
V9	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V10	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Detector	6AL5	6AL5	6BT	
V12	AM Detector-AVC-AF Amplifier	6AV6	6AV6	7BT	
V13	Audio Output	6K6GT	6K6GT	7S	
V14	Sync Amplifier	6AU6	6AU6	7BK	
V15	Noise Limiter-Sync Separator-AGC Delay	6SQ7	6SQ7	8Q	
V16	Sync Limiter-Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V17	Vert. Output	6S4	6S4	9AC	
V18	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V19	Horiz. Output	6CD6G	6CD6G	5BT	
V20	Damper	6W4GT	6W4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	AM Converter	6BE6	6BE6	7CH	
V25	AM IF Amp.	6BA6	6BA6	7BK	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ANDREA PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA:	RTMA BASE TYPE	NOTES
V26	21AP4	21AP4		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ANDREA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▰40	500	HCE-1310	AFH2-72		BO53		FP288	TVL-2830	
B	▲40	500								
C2	10	200	HCE-1335	PRS250/12		BR1225A		TC52	TVA-1504	
C3	20	200	HCE-1334	PRS250/20		BR2025A		TC55	TVA-1508	
C4A	▰20	350	HCE-1337	AFH3-36		CO27		FP376.5	TVL-3780	
B	■20	350								
C	▲20	350								
C5A	■40	450	HCE-1336	AFH3-53		BO51			R1334	
B	▰20	500		PRS25/100		BRH251A				
C	▲100	25								
C6	10	25	HCE-1320	PRS25/10		BR102A		TC22	TVA-1204	
C7	2	25	HCE-1302	PRS150/4		BBR-2-50T		TC302	TVA-1201	
C8	1-3				829-3			CT565A		
C9	5			SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C10	1.8									
C11	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C12	.7-2									
C13	47			BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C14	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C15	47			BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C16	1-3				829-3			CT565A		
C17	1-3				829-3			CT565A		
C18	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C19	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C20	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C21	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C22	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C23	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C24	1000		HCC-1938	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C25A	1500		HCC-1942	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C26	2000		HCC-1944	BPD-002	D6-202	TM5D2	801-002	DC-522	5HK-D2	
C27	470		HCC-1935	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C28	100		HCC-1922-1	SI100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C29	100		HCC-1922-1	SI100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C30	5000		HCC-1945	BPD-005	MD-005	TM5D5	811-005	DC-525	5HK-D5	
C31A	1500		HCC-1942	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C32	470		HCC-1935	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C33	470		HCC-1935	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C34	1000		HCC-1932	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	1500		HCC-1936	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C36	1.5		HCC-1920	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C37	470		HCC-1935	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C38	100		HCC-1922-1	SI100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C39	1500		HCC-1936	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C40	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C41	.1	600	HCT-1002	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C42	47									
C43	.05	600	HCT-1003	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C44	1000		HCC-1932	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C45	470		HCC-1935	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C46	300	2000								
C47	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C48	1.0	100	HCT-1027	484-1.0		PJ2W1		PT41	2TM-M1	
C49	1.0	100	HCT-1027	484-1.0		PJ2W1		PT41	2TM-M1	
C50	2.2		HCC-1915	SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	ANDREA PART No.	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C51	10000		HCC-1943	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C52	10000		HCC-1943	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C53	10000		HCC-1943	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C54	56		HCC-1941		TCN-56		N750L-560			
C55	10000		HCC-1943	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C56	10000		HCC-1943	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C57	10000		HCC-1943	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C58	470		HCC-1935	S1470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	Note 1
C59	470		HCC-1935	S1470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C60	470		HCC-1935	S1470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C61	330		HCC-1937	S1330	D6-331		GP2K-331	UC-5333	5GA-T33	
C62	2000	500	HCC-1944	1H7S-002		1W5D2	90L-002	MC547	1FM-22	
C63	.01	400	HCT-1023	P488-01	D6-103	PTE4S1	811-01	PT411	4TM-S1	
C64	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C65	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C66	250	1000	HCM-1608AK	1468L-HV-00025		5WP1ST25		MCK327		
C67	.003	1000	HCT-1021	P1088-003		PTE18D3		PT1823	MB-D3	
C68	100	500	HCM-1601A	1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C69	.02	600	HCT-1030	P688-02	DD-203	PTE6S2		PT612	6TM-S2	
C70	1000		HCT-1045	P1D-005	MD-102	TM5D5	811-005	DC-525	5HK-D5	Note 2
C71	250	500	HCM-1624C	1469-00025	TC2-270	5R5T25		MCB240		
C72	.5	200	HCT-1033	P288-5		PJ2P5		PT405	2TM-P5	
C73	.01	600	HCT-1008	P688-01	D6-103	PTE6S1	811-01	PT611	6TM-S1	
C74A	.002			P688-002		PTE6D2		PT622		
B	.005		▪FM-5289	P688-005	▪PC-100	PTE6D5	▪1405-01	PT625	▪101C1	
C	.005			P688-005		PTE6D5		PT625		
C75	5000	1000	HCM-1602AK	1467L-HV-005	DD16-502	1WP1D5				
C76	.08	600	HCT-1029					PT601	6TM-P1	
C77	.1	600	HCT-1002	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C78	.1	200	HCT-1013	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C79	.1	600	HCT-1002	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C80	.25	400	HCT-1015	P488-25		PTE4S25		PT4025	4TM-P25	
C81	500	500	HCM-1625A	1469-0005		5R5T5		MCB245	MS-35	
C82	100	500	HCM-1601A	1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C83	3000	500	HCM-1606A	1467-002	D6-202	1W5D2	90L-002	MC457	1FM-22	
C84	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C85	.02	600	HCT-1030	P688-02	DD-203	PTE6S2		PT612	6TM-S2	
C86	1.0	100	HCT-1027	484-1.0		PJ2W1		PT41	2TM-M1	
C87	10	500	HCM-1629A	1469-00001	TC2-10	5R5Q1	NP0K-100	MCB215	MS-41	
C88	250	500	HCM-1624C	1479-00025		5R5T25		MCB240		
C89	.01	800	HCT-1008	P688-01	D6-103	PTE6S1	811-01	PT611	6TM-S1	
C90	1200	500	HCM-1633A							
C91	500	500	HCM-1625A	1469-0005		5R5T5		MCB245	MS-35	
C92	.1	600	HCT-1002	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C93	.5	200	HCT-1033	P288-5		PJ2P5		PT405	2TM-P5	
C94	150	2000	HCM-1619C2K							
C95	150	3000	HCM-1619C3K							
C96	.25	400	HCT-1015	P488-25		PTE4P25		PT4025	4TM-P25	
C97	.1	600	HCT-1002	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C98	80	800	HCM-1612D							
C99	500	30000	HCH-2706							
C100	15		HCC-1940							
C101	10		HCC-1934							
C102	5		HCC-1939							
C103	5		HCC-1939							
C104	100	500	HCM-1601A	1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C105	15	500		S1I5NP0	TC2-15		NP0K-150		MS-41	Note 1
C106	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C107	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C108	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C109	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C110	.05	400	HCT-1003	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C111	.1	200	HCT-1013	P288-1	DF-104	PTE4P1		PT401	2TM-P1	
C112	2000		HCC-1944	BPD-002	D6-202	TM5D2	801-002	DC-522	5HK-D2	
C113	.05	400	HCT-1003	P488-05		PTE4S5		PT415	4TM-S5	Note 1
C114	.05	400	HCT-1003	P488-05		PTE4S5		PT415	4TM-S5	
C115	.05	400	HCT-1003	P488-05		PTE4S5		PT415	4TM-S5	

Note 1. Not used in all Models.
Note 2. Some Models use .002MFD in this application.
▪ Items C74A, C74B, C74C, R78A, R79B, R79C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	ANDREA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	50KΩ	½	GRV-831	QJ-79*	RTV-75		UP54L	Horiz. Hold-Panel
B	2 Meg	½					UR28L ‡	Vert. Hold-Rear
R2A	500KΩ	½	GRV-837	QJ-451 **			UP55A	Tone-Panel
B	500KΩ	½					UR55A	Volume-Rear
R3A	750Ω	4	GRV-838					Contrast-Wire Wound-Panel-Note
B	1 Meg	½						Brightness-Rear
R4A	4000Ω	2	GRV-839	W-4000	A43-4000	VK-134	R5000L	Vert. Linearity-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A
R5A	2 Meg	½	GRV-812-1	QU1-139	AG-62-8	AB-75	SU-56	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A

* CONCENTRIKIT EQUIVLAENT-KIT K-2, BASE ELEMENTS & SHAFTS B11-123 & P1-121 (Panel) B11-139 & R1-207 (Rear).
** CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B13-133 & P1-121(Panel) B13-133 & R1-207 (Rear).
Note . Some models may use a carbon control in this application.
† UNIVERSAL REPLACEMENT(MALLORY EXACT DUPLICATE PART NO. UE1033).

RESISTORS

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA ANDREA PART No	REPLACEMENT DATA IRC PART No.	NOTES
R 6	3900Ω	1		BTS-3900	
R7	33KΩ	1		BTS-33K	
R8	2.2MΩ	1			
R9	470Ω	1		BTS-470	
R10	1.8MΩ	1		BTS-1.8Meg	
R11	10KΩ	1			
R12	180KΩ	1		BTS-180K	
R13	10KΩ	1			
R14	10KΩ	1			
R15	47000Ω	1	GRC-237	BTB-4700	
R16	15KΩ	2	GRC-237	BTB-15K	
R17	8200Ω	1	GRC-285		
R18	470	1	GRC-211		
R19	33KΩ	1	GRC-203		
R20	10000Ω-5%	1	GRC-246	BTS-1000-5%	
R21	2200Ω	1	GRC-219	BTS-2200	
R22	39KΩ-5%	1	GRC-315	BTS-39K-5%	
R23	6800Ω	1	GRC-221		
R24	470Ω	1	GRC-211		
R25	10KΩ	2	GRC-267	BTB-10K	
R26	4700Ω	2	GRC-205	BTS-4700	
R27	470	1	GRC-211		
R28	150Ω	1	GRC-202	BTS-150	
R29	470Ω	1	GRC-213	BTS-470	
R30	2200Ω	1	GRC-219	BTS-2200	
R31	470Ω	1	GRC-213	BTS-470	
R32	470Ω	1	GRC-213	BTS-470	
R33	270Ω	1	GRC-211	BTS-27K	Note
R34	470KΩ	1	GRC-228	BTS-470K	
R35	330KΩ	1	GRC-301	BTS-330K	
R36	10KΩ	1	GRC-204	BTS-10K	
R37	18KΩ-5%	1	GRC-261	BTS-18K-5%	Note
R38	2200Ω	2	GRC-319	BTB-2200	
R39	2200Ω	2	GRC-319	BTB-2200	
R40	470KΩ	1	GRC-228	BTS-470K	
R41	33KΩ	1	GRC-203	BTS-33K	
R42	330KΩ	1	GRC-301	BTS-330K	
R43	470KΩ	1	GRC-228		
R44	82Ω	1	GRC-215	BTS-82	
R45	9100-5%	1		BTS-910-5%	
R46	47KΩ	1	GRC-207	BTB-47K	
R47	68Ω	1	GRC-214		
R48	33KΩ	1	GRC-203	BTS-33K	
R49	1000Ω	1	GRC-210	BTS-1000	
R50	56KΩ	1	GRC-322	BTS-56K	
R51	3700-5%	1	GRC-316	BTS-3700-5%	
R52	39KΩ-5%	1	GRC-315	BTS-39K-5%	
R53	6800Ω	1	GRC-221	BTS-6800	
R54	6800Ω	1	GRC-221	BTS-6800	
R55	47KΩ	1	GRC-207	BTS-47K	
R56	4.7MeG	1	GRC-242	BTS-4.7Meg	
R57	3300KΩ	1	GRC-301	BTS-330K	
R58	680K	1	GRC-310	BTA-680	
R59	10KΩ	2	GRC-267	BTB-10K	
R60	110KΩ-5%	1		BTS-110K-5%	
R61	1.8Meg	1	GRC-221	BTS-1.8Meg	
R62	2200Ω	1	GRC-219	BTS-2200	
R63	110KΩ-5%	1		BTS-110K-5%	
R64	39KΩ-5%	1	GRC-315	BTS-39K-5%	
R65	110KΩ-5%	1		BTS-110K-5%	
R66	68KΩ	1	GRC-204	BTS-68K	
R67	150KΩ	1	GRC-243	BTS-150K	
R68	27KΩ	1	GRC-234	BTA-27K	
R69	39000-5%	½	GRC-349	BTS-3900-5%	
R70	6800Ω	2		BTB-6800	
R71	3.3Meg	1	GRC-206	BTS-3.3Meg	
R72	470KΩ	1	GRC-228	BTS-470K	
R73	2.2Meg	1	GRC-317	BTS-2.2Meg	
R74	680KΩ	1	GRC-302	BTS-680KΩ	
R75	10KΩ	1	GRC-232	BTA-10K	
R76	10KΩ	1	GRC-232	BTA-10K	
R77	6800Ω	2		BTB-6800	
R78	22KΩ	1	GRC-201	BTS-22K	
R78A	22KΩ			BTS-22K	
B	8200Ω		▪FM-5289	BTS-8200	
C	8200Ω			BTS-8200	
R80	470KΩ		GRC-228	BTS-470K	
R81	6800Ω		GRC-221	BTS-680K	
R82	470KΩ		GRC-228	BTS-470K	
R83	1 Meg		GRC-274	BTS-1 Meg	
R84	9100-5%			BTS-910-5%	
R85	560Ω		GRC-250	BTS-560	
R86	560Ω		GRC-250	BTS-560	
R87	1000Ω-5%		GRC-245	BTS-1000-5%	
R88	4700Ω-5%		GRC-305	BTS-4700-5%	
R89	110KΩ-5%			BTS-110K-5%	
R90	22KΩ		GRC-201	BTS-22K	
R91	820KΩ		GRC-246	BTS-820K	
R92	150KΩ		GRC-243	BTS-150K	
R93	150KΩ		GRC-243	BTS-150K	
R94	4700Ω		GRC-205	BTS-4700	
R95	150KΩ		GRC-243	BTS-150K	
R96	3.3Meg		GRC-206	BTS-3.3Meg	
R97	150KΩ		GRC-243	BTS-150K	
R98	8200Ω		GRC-285	BTS-8200	
R99	68KΩ		GRC-204	BTS-68K	
R100	4700Ω		GRC-373		
R101	470KΩ		GRC-228	BTS-470K	
R102	180Ω	7	GRW-534	1 3/4A-180	
R103	680Ω	4	GRW-544		
R104	18KΩ	5	GRW-528	1 3/4A-18K	
R105	3300Ω	1	GRC-254	BTA-3300	
R106	3.9Ω	½	GRC-278		
R107	470KΩ	1	GRC-309		
R108	47Ω	1	GRC-211		
R109	10KΩ	2	GRC-204	BTS-10K	
R110	1500Ω	7	GRW-542	1 3/4A-1500	
R111	3000Ω	5	GRW-541	1 3/4A-3000	
R112	22KΩ	1	GRC-201	BTS-22K	
R113	27KΩ	2	GRC-265	BTB-27K	
R114	2.2MeG	1	GRC-317	BTS-2.2Meg	
R115	2200Ω	1	GRC-219	BTS-2200	
R116	68Ω	1	GRC-214		
R117	47KΩ	2	GRC-323	BTB-47K	
R118	2200Ω	1	GRC-219	BTS-2200	
R119	3300Ω	1	GRC-220	BTS-3300	
R120	15KΩ	1	GRC-237	BTS-15K	
R121	110KΩ-5%	1		BTS-110K-5%	
R122	150KΩ	1	GRC-243	BTS-150K	

Note. Some models may use a 10KΩ resistor in this application.
▪ Items R79A, R79B, R79C, C74A, C74B, C74C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ANDREA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC	570VCT	5VAC	6.3VAC	ST-3053					
	②2.1KA	.280ADC	⑤ 6A	⑨1.5A						
		tap ⑥		SEC. 4						
		105VAC		6.3VAC						
		.003ADC		⑨9.2A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA ANDREA PART No	STANCOR PART No.	MERIT PART No.	CHICAGO PART No	TRIAD PART No	RCA TYPE No.	NOTES
T2	190Ω	1000Ω	ST-3029	A-8122	A-4003	TBO-2	A-97Y	208T9	Vert. Osc. Trans.
T3	509.1Ω tap ⑨	0Ω	ST-3051		HVO-9	TFB-13① ④	D-19 ⑤	230T1 Ⓑ	Horiz. Output Trans.
	5.3Ω,								
	9.5Ω,								
	12.6Ω,								
	34.6Ω,								
	38.1Ω,								
	40.1Ω,								
	59.1Ω								
T4	1.5KΩ tap ⑥		ST-3040-1	A-8141	A-3039	TSO-12	A-104X	226T1	Vert. Output Trans.
	4.2Ω								
T5A	24Ω		ST-3049	DY-9A	MDF-70	TY-3	Y-17	21UD2	Horiz. Deflection Coils
B	46Ω								Vert. Deflection Coils
T6	8.5Ω		SA-361	WC-5 ③	MWC-1 ⑤	TWL-1	WC-11③ ⑤	212R1 ④	Width Coil

① Drill new mounting holes.
② Wire as in original circuit except, connect terminal 7 to terminal 8. Connect present terminal 7 to new terminal 5 and present terminal "T" to new terminal 3.
③ Do not use secondary.
④ Drill new mounting hole.
⑤ Connect terminal 7 to terminal 8.
⑥ See instruction sheet packed with unit for terminal connections.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ANDREA PART No	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	NOTES
T7	7KΩ	3.5Ω	466Ω	.72Ω	Part of spkr.	A-3878	A-2931	RO-13	S-7X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP	REPLACEMENT DATA ANDREA PART No	REPLACEMENT DATA JENSEN PART No	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	7"	PM	3.5Ω	SL-4014 SL-401(1)	ST-806 Mod. P7-U	7A21	↓ Alternate speaker

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ⁰ Ω	REPLACEMENT DATA ANDREA PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No
L1	.260ADC	100Ω	4.2 Hy.	ST-3052				C-15X

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI	DC RES. SEC	REPLACEMENT DATA ANDREA PART No.	MILLER PART No	MEISSNER PART No	IRC PART No	NOTES
L2	Ant. RF, Mixer Grid & Osc. Coils	0Ω						
L3	Neutr.Coil	0Ω						
L4	RF Choke	0Ω						
L5	RF Choke	0Ω						
L6	Conv. Plate	.1Ω	.1Ω					
L7	IF Coupling	0Ω		SA-354				
L8	1st. Video IF Grid	1.7Ω		SA-355		17-4503		Includes Trap
L9	1st. Video IF Plate	1.8Ω		SA-357				
L10	2nd. Video IF Grid	1.4Ω		SA-358				
L11	41.25MC & 47.25 Trap Assembly			SA-356				
L12	RF Choke	3.2Ω		SA-362	4606		CLA	2.7 Microhenries
L13	2nd. Video IF Plate	2.2Ω	1.6Ω	SA-359				
L14	3rd. Video IF	1.8Ω	1.2Ω	SA-360				
L15	4th. Video IF	1.8Ω	1.2Ω	SA-360				
L16	RF Choke	5.5Ω		SA-348	5172	19-3093		72 Microhenries
L17	RF Choke	6Ω		SA-349	4630	19-3093		56 microhenries
L18	Series Peaking Coil	6Ω		SA-349	4630	19-3093		56 Microhenries
L19	Shunt Peaking Coil	13Ω		SA-350		19-1923		335 Microhenries
L20	Series Peaking Coil	6.5Ω		SA-285	4646	19-3250		215 Microhenries
L21	Series Peaking Coil	11Ω		SA-364	6181	19-3250		270 Microhenries
L22	Shunt Peaking Coil	13Ω		SA-350				335 Microhenries
L23	4.5MC Trap	2.9Ω		SA-328	1470	20-1004		Andrea part # includes C42
L24	1st.Sound IF	1.4Ω		SA-353	1470-A ▪	17-1021 ▲		
L25	2nd.Sound IF	2Ω	2Ω	SA-352	6203	17-1021 †		
L26	Ratio Det.	12Ω	1.9Ω CT	SA-351	6205			Tertuary Winding - .95Ω
L27	Horiz. Osc.	130Ω		SA-335	6183	20-1402		Tapped @ 80Ω. horiz. waveform winding - 45Ω
L28	Loop Ant.	0Ω	.8Ω	SA-363				
L29	Osc.Coil	.6Ω	4.5Ω	SA-342	71-Osc. ▪	14-1073		
L30	Input IF	16.5Ω	17Ω	SA-343A	12-C1	18-6758		
L31	Output IF	17Ω	17Ω	SA-344D	12-C8	18-6770		
L32	Fil. Choke	0Ω						

* Add 47MMF capacitor externally.
† Drill new mounting holes.
▪ Drill mounting hole.
▲ Drill one new mounting hole, detune unused section.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA ANDREA PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No
M1	.003A	FM-5279	NA5	8J1	1002A	6S65	65

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ANDREA PART No. FUSE	ANDREA PART No. HOLDER	LITTELFUSE PART No FUSE	LITTELFUSE PART No HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
M2	3AG-P/T	1/4A 250V	FM-5163		310, 250 (3AG-1/4A-P/T)		GJV-1/4	

ANDREA MODELS C-VM21, CO-VM21, T-VM21, 2C-VM21 (Ch. VM21)

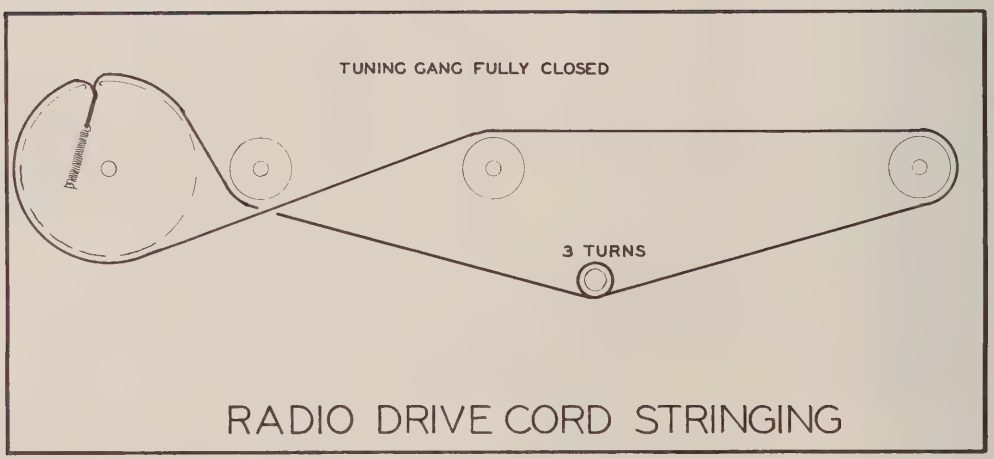
PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ANDREA PART No.		NOTES
M3	Bayonet	6-8	.25	Blue			Type 44 (2 Used)

MISCELLANEOUS

ITEM No.	PART NAME	ANDREA PART No.	NOTES
M4	RF Tuner	FM-5280	
M5	Filter	FM-5282	High Pass (300Ω)
M6	Crystal Diode	FM-5276	Video Detector (1N64)
M7	Crystal Diode	FM-5276	Sync. Detector (1N64)
M8	Switch	FM-5283	Function Selector
M9	Focus Magnet	FM-5285	Includes Centering Device
M10	Ion Trap	FM-5187	
M11	Tuning Capacitor	HCV-2112-2	14-456MMF, 14-456MMF
B3, B4	Trimmer Capacitor	HCV-2123	Horiz. Lock-in, Horiz. Drive-(Dual 15-175MMF)
A42, A44	Trimmer Capacitor	HCV-2113	AM Antenna and Osc. (Dual 2-22MMF)
A43	Trimmer Capacitor	HCV-2114	Padder, AM Osc. 210-560MMF
	Safety Glass	FM-5270	
	Mask	EP-743	
	Dial Scale	FM-5272	
	Pointer	FM-5271	
	Knob	FM-5288	Pointer Type
	Knob	FM-5287	Large Dual for 3/8 " shaft
	Knob	FM-5214	Large Dual for 17/16" shaft
	Knob	FM-5216	Small Dual for 7/16" shaft



RADIO DRIVE CORD STRINGING

TROUBLE SHOOTING AIDS (CONT.)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check 1/4 amp. fuse located next to VI9. Check by substitution V18, V19, V20 and V21. Check waveform W15.

If Unsatisfactory	If Satisfactory
Check V18 and associated components.	Check components of horizontal output and damper circuit, especially T3, T5A, and T6.

WEAK HIGH VOLTAGE

Substitute V18, V19, V20, V21, V22 and V23. Follow procedure outlined under LOSS OF HIGH VOLTAGE.

BLOOMING

Follow procedure outlined under WEAK HIGH VOLTAGE .

POWER

SMALL RASTER

Substitute V22 and V23. Check filter components. Check B plus circuit for shorts.

DIM PICTURE

Substitute V22 and V23. Check B plus components. Check picture tube for low emission.

GENERAL

NO SOUND, NO PICTURE, NO SNOW

Substitute V2 and V6. Check associated components.

WEAK PICTURE AND WEAK SOUND

Check by substitution V3, V4 and V5. Check IF alignment and components.

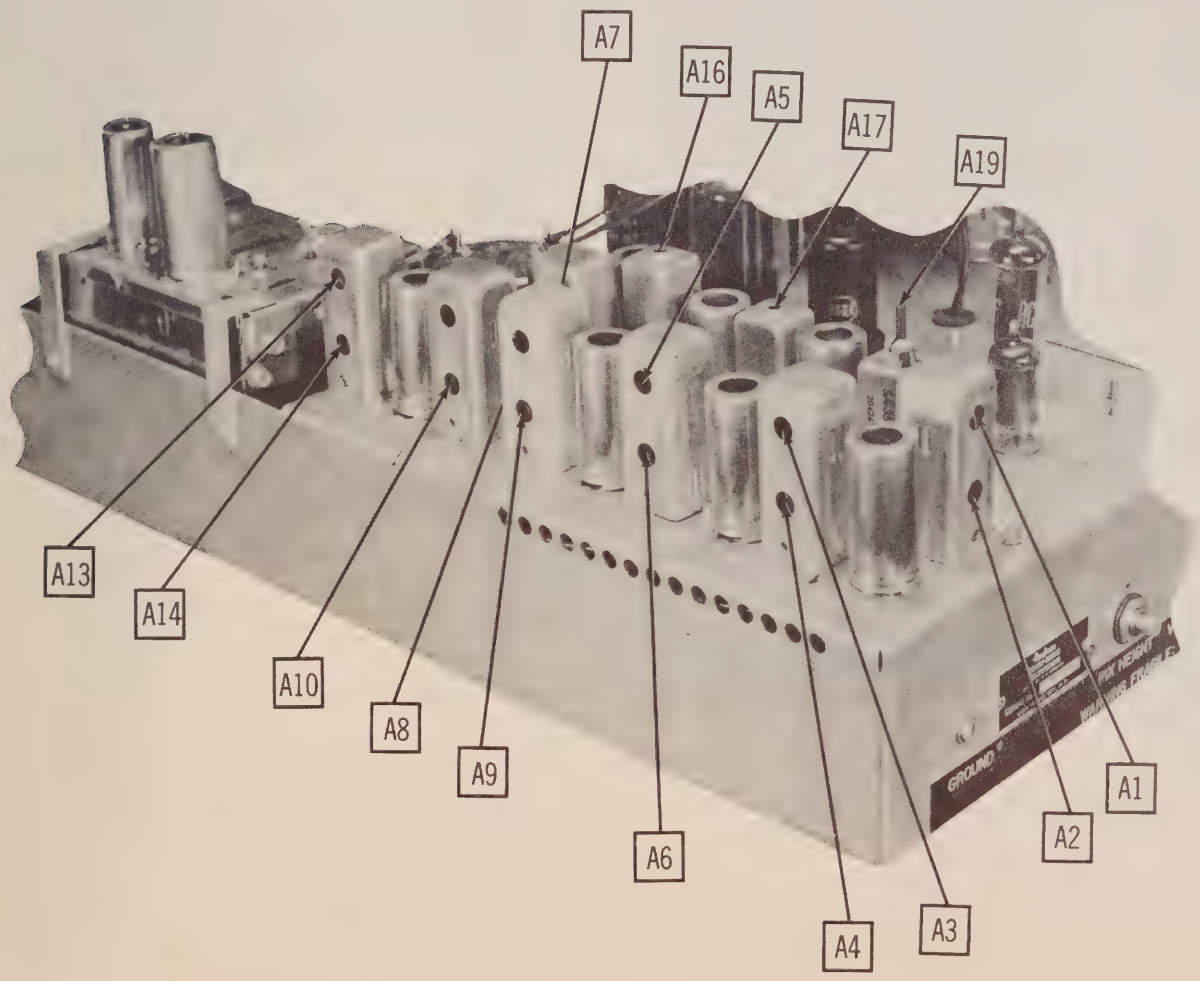
SNOW BUT NO PICTURE OR SOUND

Substitute V1 and check tuner alignment.

SOUND BUT NO PICTURE

Substitute V7 and check picture tube.

Symptoms shown above are assumed and are not indicative of the quality and workmanship of this receiving equipment.



SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

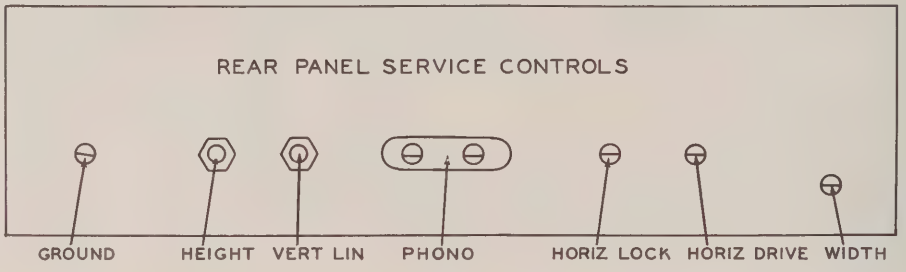
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust the Horiz. Osc. slug L27 until, picture synchronizes horizontally . (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L26 located on top of chassis . (See tube placement chart).

FUSES

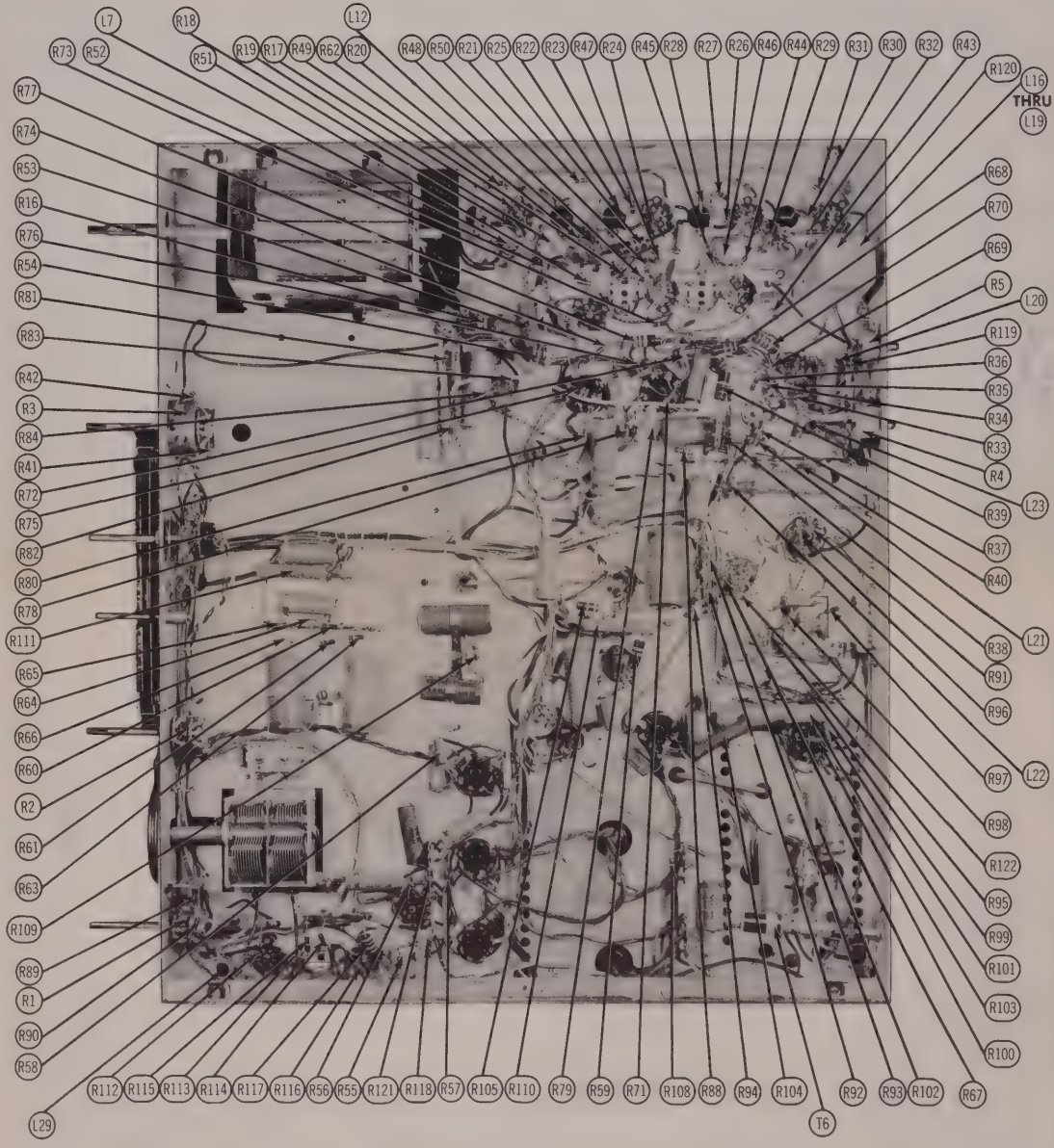
One fuse is used for Horiz. Sweep Circuit protection. (For location, see tube placment chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P. M. Focusing assembly. Adjust the centering lever from side to side , and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 10 push on type control knobs from front panel.
2. Disconnect built-in antenna & transmission line.
3. Remove 8 wood screws. Remove rear cover.
4. Disconnect speaker. (2 separate speaker plugs). Remove 4 speaker nuts. Remove speaker.
5. Disconnect AM loop antenna.
6. Remove 4 chassis bolts. Remove chassis.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

RTMA MEMBER RADIO-TELEVISION MANUFACTURERS ASSOCIATION

FADA
MODELS 17T6, 17T9

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MODEL 17T6

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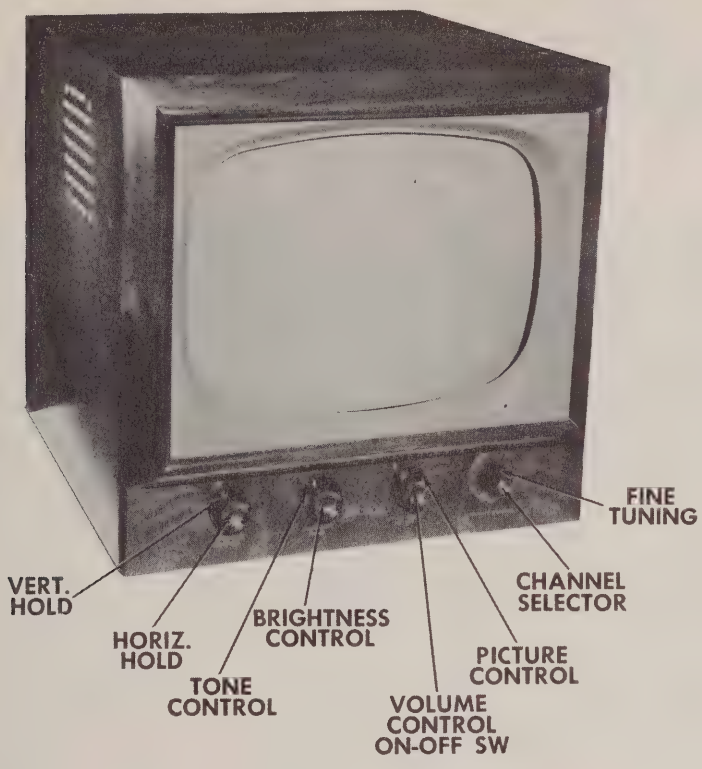
MODELS 17T6, 17T9



FADA
MODELS 17T6, 17T9

FADA MODEL 17T6

TRADE NAME	Fada Models 17T6, 17T9
MANUFACTURER	Fada Radio & Electric Co., Inc., 525 Main St., Belleville, N.J.
TYPE SET	Television Receiver
TUBES	Twenty-One

POWER SUPPLY 110-120 Volts AC-60Cycle RATING 2.26 Amp. @ 117 Volts AC
TUNING RANGE—Channels 2 thru 13, Video IF 26.1MC, Sound IF 21.6MC (Intercarrier)

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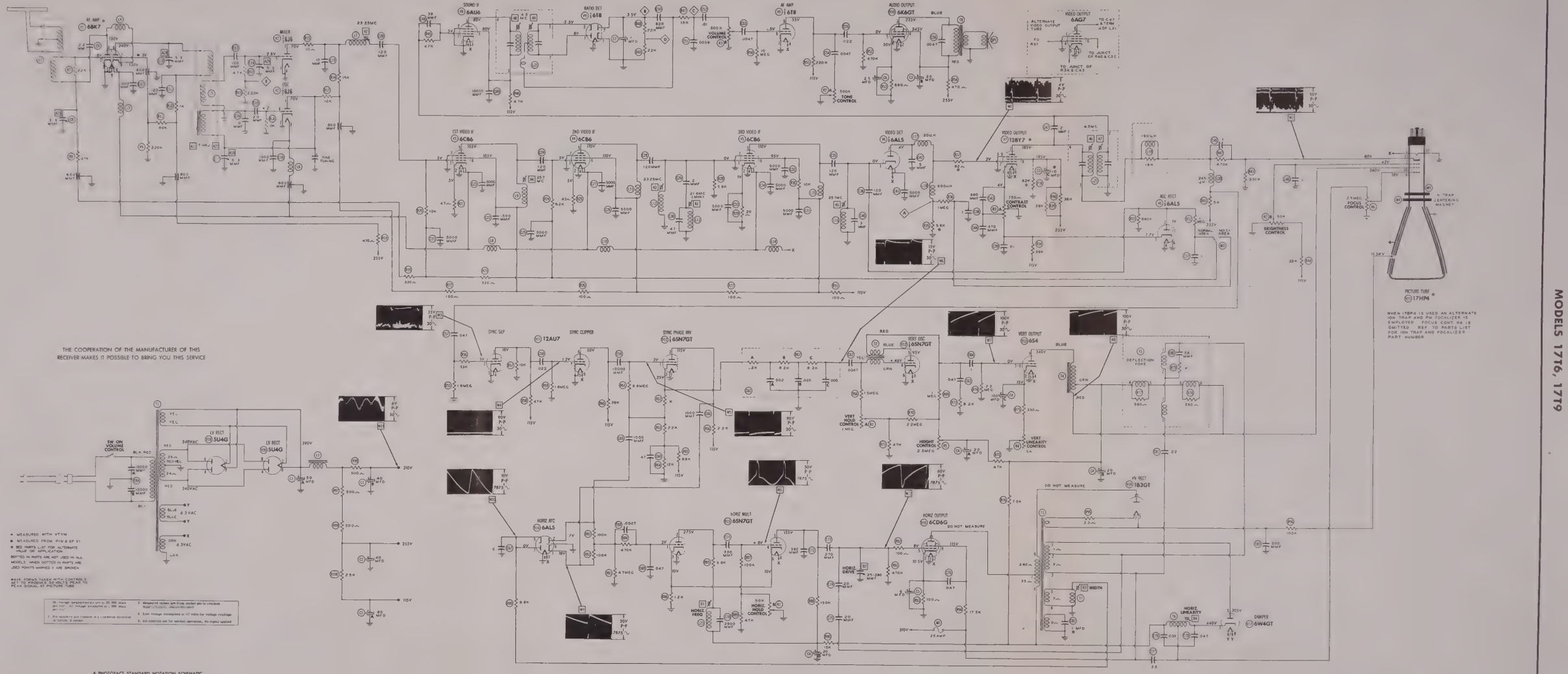

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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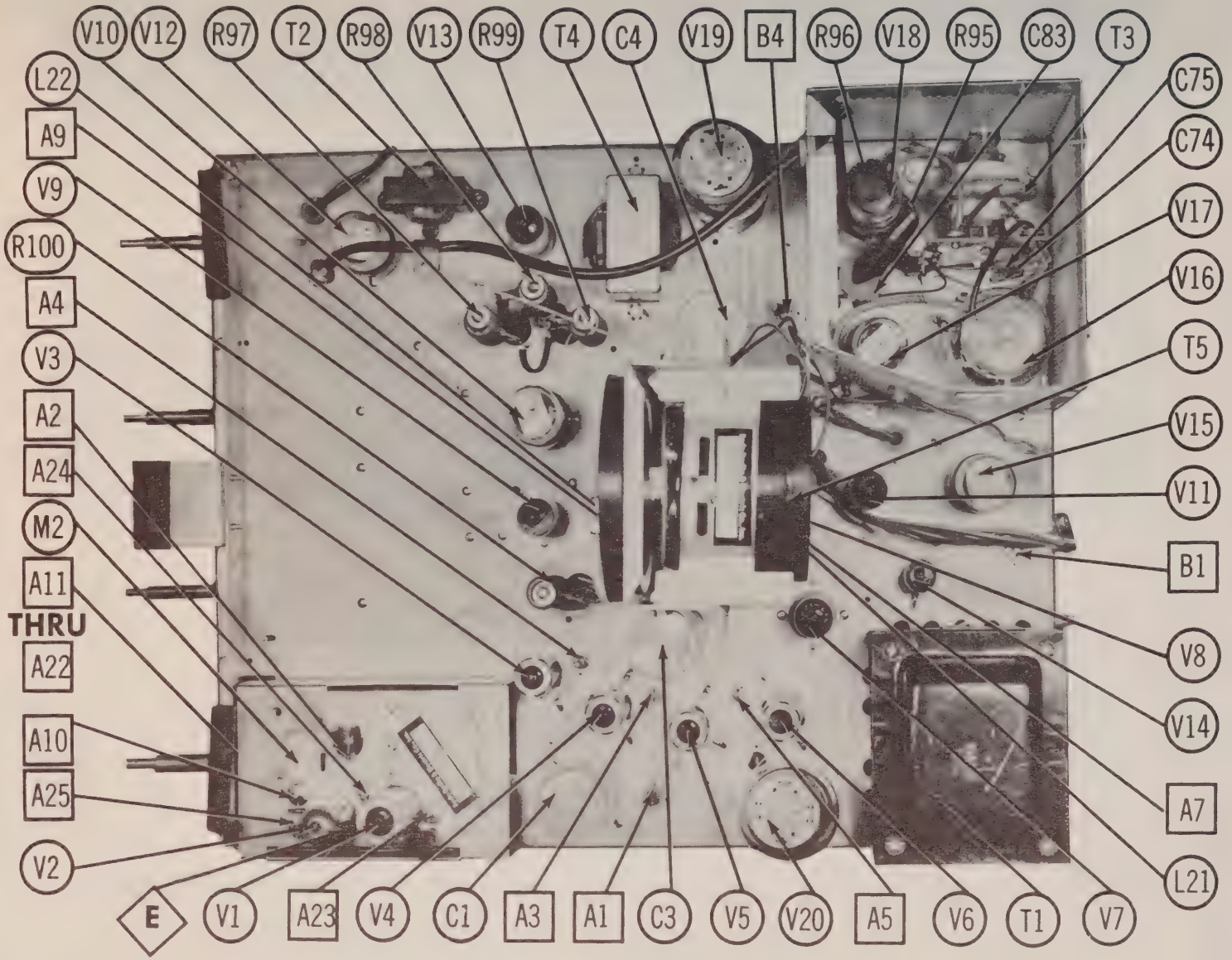
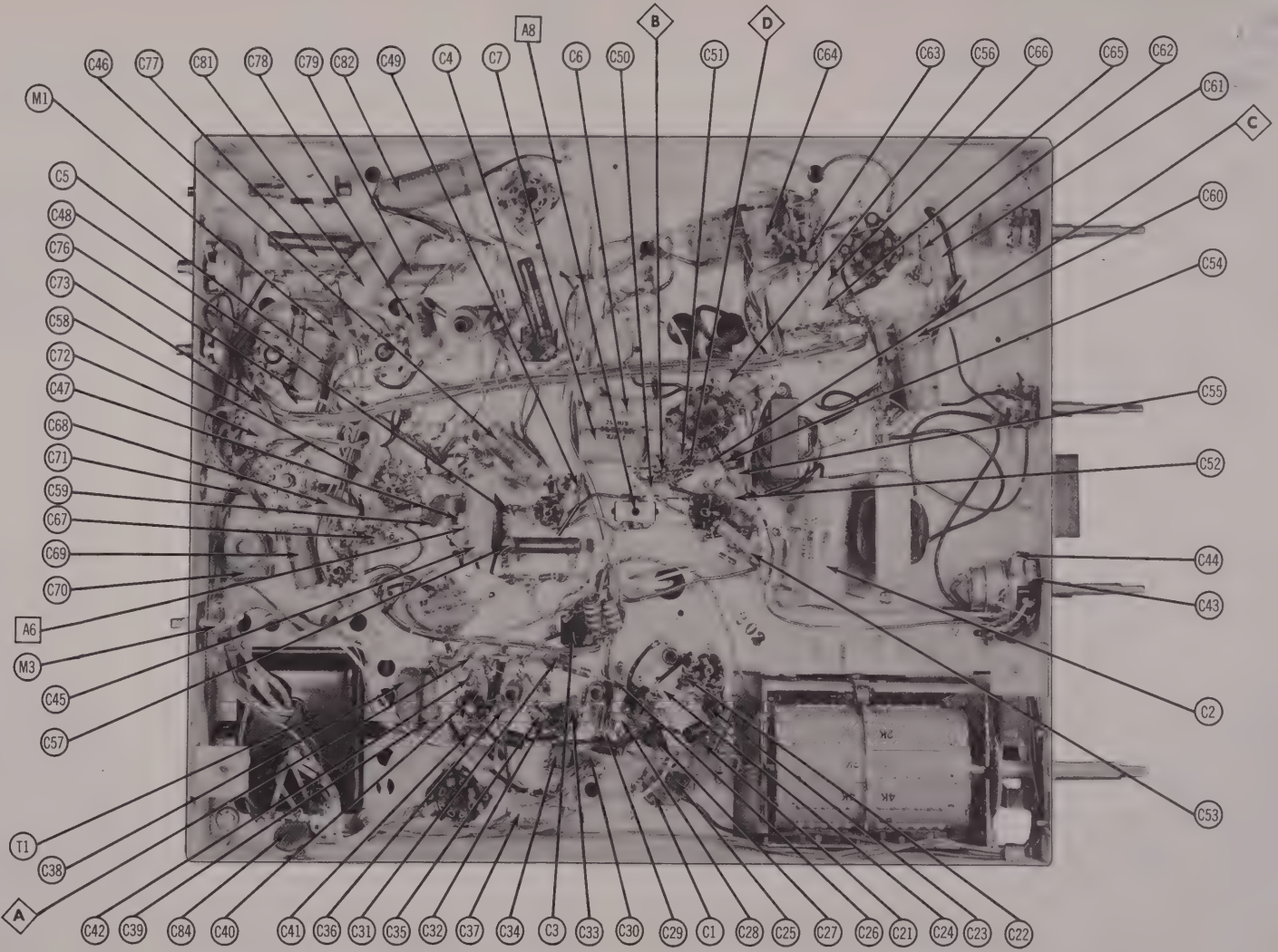
MODELS 1776, 1779

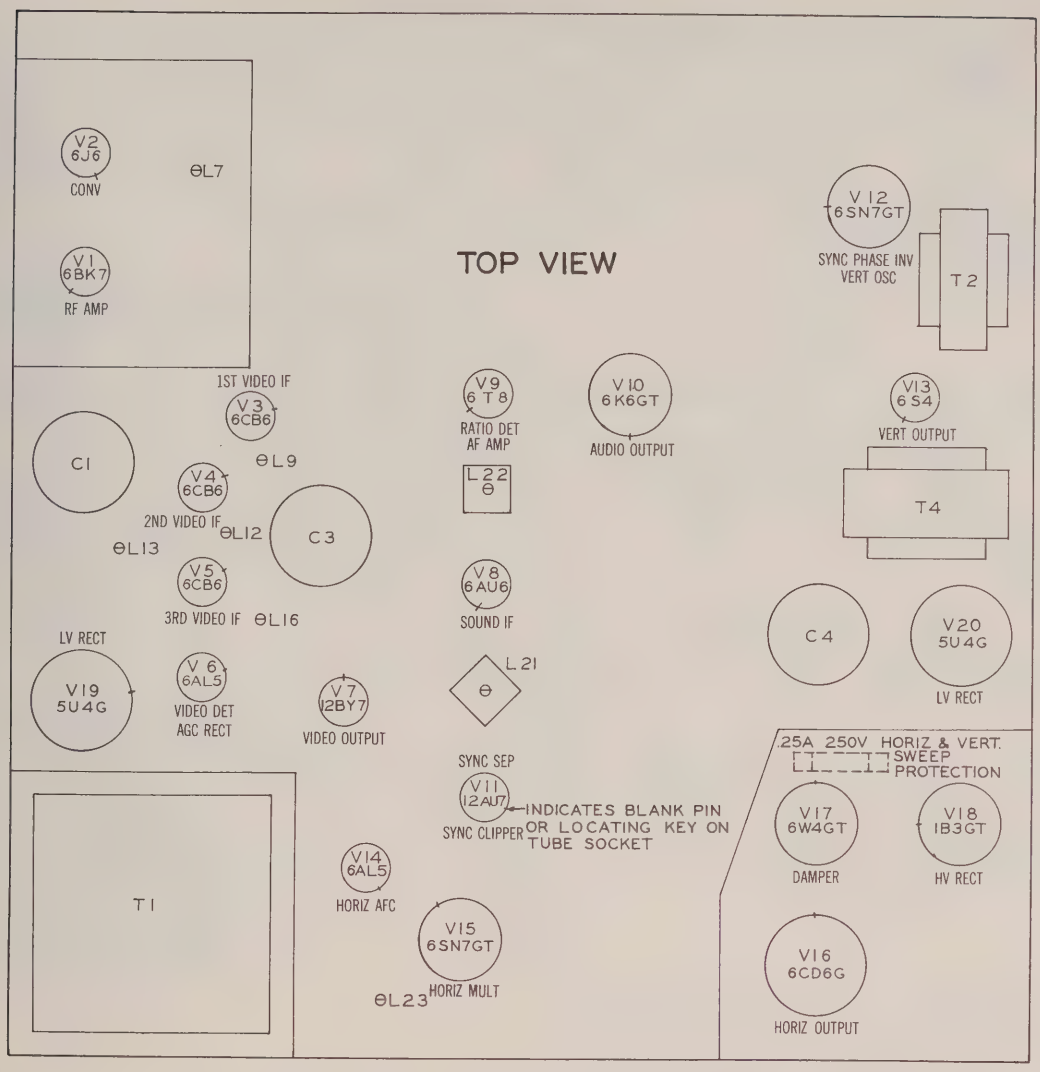


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19, V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V7
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V21
Has pic, no sound - V8, V9, V10

SYNC FAILURE
No vert. sync - V12
No horiz. sync - V12, V14, V15
No vert. or horiz. sync - V11, V12

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V21, FUSE (M1)
No vertical deflection - V12, V13
Poor vert. linearity or foldover - V12, V13
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, V19, V20
Vert. off freq. - V12
Horiz. off freq. - V12, V14, V15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt battery to the ungrounded side of C25. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	21.6MC (Unmod)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	23.25MC	"	"	A2, A3	Adjust for maximum deflection. Attenuate generator to maintain approximately 2.5Volts at VTVM.
3.	"	"	25.7MC	"	"	A4, A5	"

OVERALL VIDEO IF RESPONSE CHECK

Leave bias battery connected as under Video IF Alignment. If output of sweep generator is too low to give a usable indication on scope, reduce the bias to 3 volts.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.6MC 22.7MC 26.1MC	Any	Vert. amp to point (A) Low side to chassis.		Check for response curve as in Fig. 1. If necessary retouch A2 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A6, A7, A8	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to point (C) Common to point (D)	A9	Adjust for a zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to point (A) Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp to point (B) Low side to chassis.	A6, A7, A8	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
6.	"	"	"	"	"	Vert. amp to point (C) Low side to chassis.	A9	Reconnect capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig 3 SLIGHTLY retouch A8 for maximum amp. and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency, approximately the same amount for a majority of the channels it may be possible to correct them in one step using A10.
It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel.
If adjustment of A10 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp to point (B) Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

RF AND MIXER ALIGNMENT

Connect bias battery as under Video IF Alignment except, use a 3 volt instead of 4.5 volt battery.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp thru 10KΩ to point (E) Low side to chassis.	A23,A24, A25	Adjust for response curve similar to Fig. 5.
9.	"	"	213.25MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel make compromise adjustments of A23, A24 and A25 with channel switch set to that channel, then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.35MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

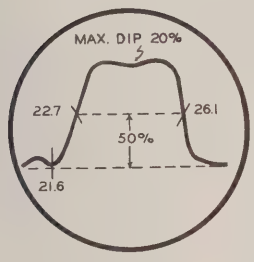


FIG. 1

FIG. 2

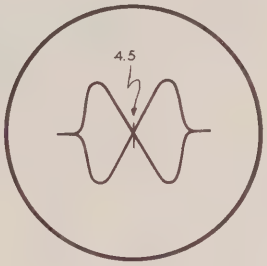


FIG. 3

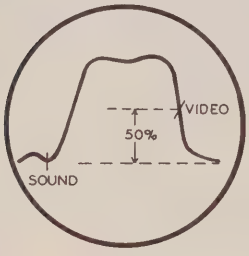


FIG. 4

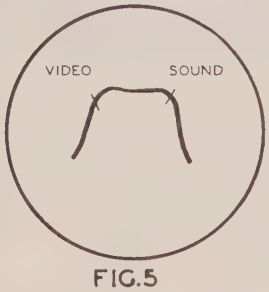
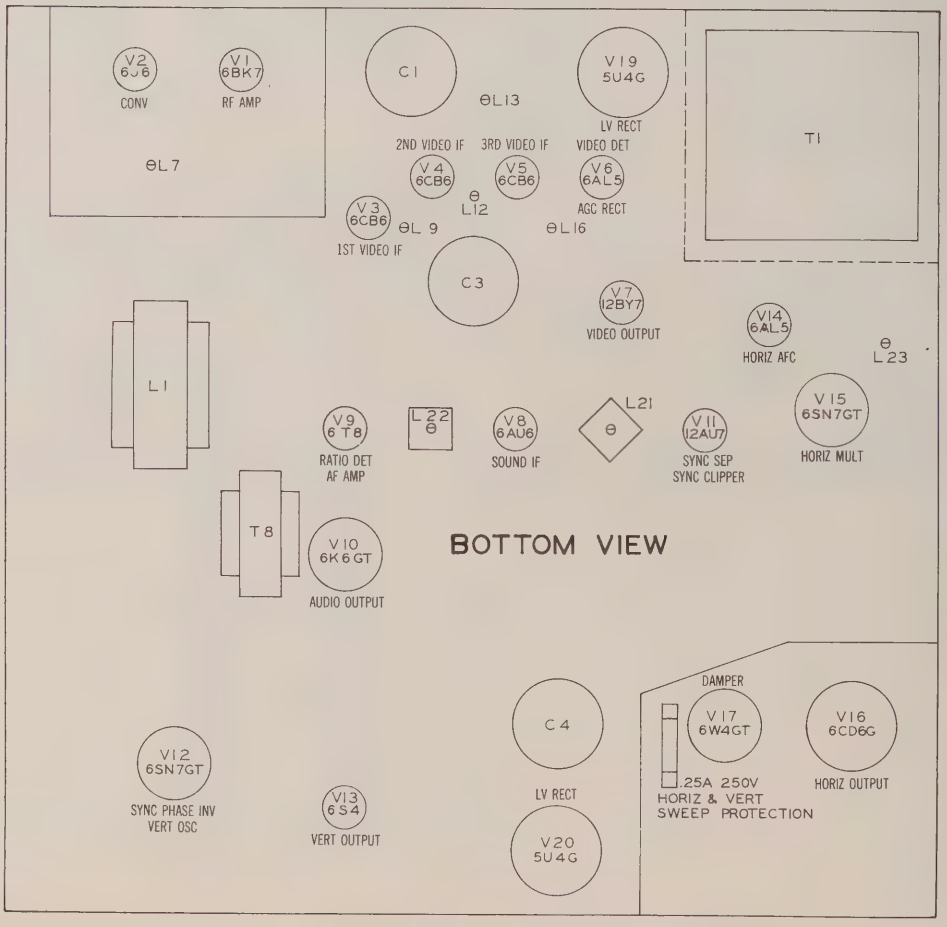


FIG. 5

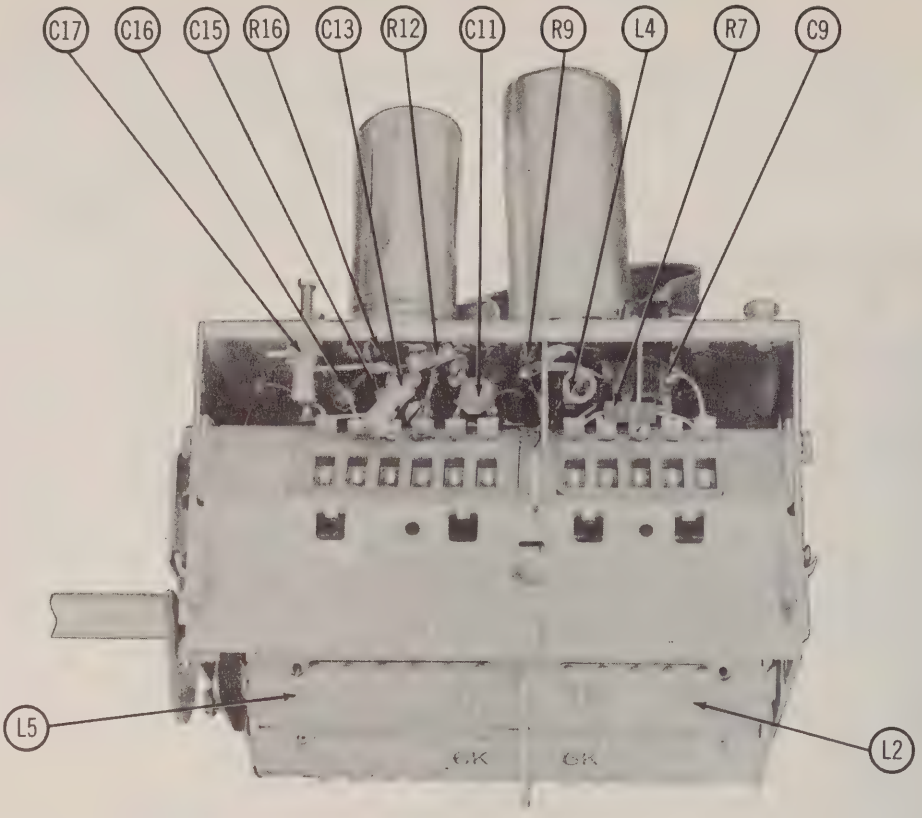
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	1.7Meg	0Ω	.1Ω	0Ω	†2.5KΩ	†80KΩ	INF	0Ω
V 2	6J6	15KΩ	20KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	1.7Meg	47Ω	.1Ω	0Ω	†3.8KΩ	†3.8KΩ	0Ω		
V 4	6CB6	1.7Meg	47Ω	.1Ω	0Ω	†3.8KΩ	†3.8KΩ	0Ω		
V 5	6CB6	.2Ω	120Ω	.1Ω	0Ω	†3.6KΩ	†14KΩ	0Ω		
V 6	6AL5	.2Ω	680KΩ	.1Ω	0Ω	550Ω	0Ω	5.6KΩ		
V 7	12BY7	250Ω	5.6KΩ	0Ω	0Ω	0Ω	.1Ω	†6KΩ	†17KΩ	0Ω
V 8	6AU6	47KΩ	0Ω	.1Ω	0Ω	†8.2KΩ	†8.2KΩ	0Ω		
V 9	6T8	INF	44KΩ	INF	.1Ω	0Ω	INF	0Ω	10Meg	†220KΩ
V 10	6K6GT	INF	.1Ω	†2KΩ	†1.6KΩ	470KΩ	INF	0Ω	680KΩ	
V 11	12AU7	†18KΩ	1.8Meg	0Ω	0Ω	0Ω	†43KΩ	1.8Meg	0Ω	.1Ω
V 12	6SN7GT	6.8Meg	†5.5KΩ	15KΩ	2.1Meg	1.6Meg	0Ω	0Ω	.1Ω	
V 13	6S4	INF	1.1KΩ	2.2Meg	.1Ω	0Ω	2.2Meg	INF	INF	#8.6KΩ
V 14	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	6.8KΩ	0Ω	6.8KΩ		
V 15	6SN7GT	5.4Meg	#22KΩ	1.2KΩ	137KΩ	#165KΩ	1.2KΩ	0Ω	.1Ω	
V 16	6CD6G	INF	.1Ω	100Ω	470KΩ	470KΩ	INF	0Ω	†18KΩ	Top Cap #43Ω
V 17	6W4GT	INF	INF	800KΩ	♦11Ω	†600Ω	♦7Ω	INF	INF	
V 18	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap #284Ω
V 19	5U4G	INF	16KΩ	INF	24Ω	INF	26Ω	INF	16KΩ	
V 20	5U4G	INF	16KΩ	INF	24Ω	INF	26Ω	INF	16KΩ	
V 21	17HP4	.1Ω	18KΩ	Pin 6 190KΩ	Pin 10 #7.5KΩ	Pin 11 200KΩ	Pin 12 0Ω			

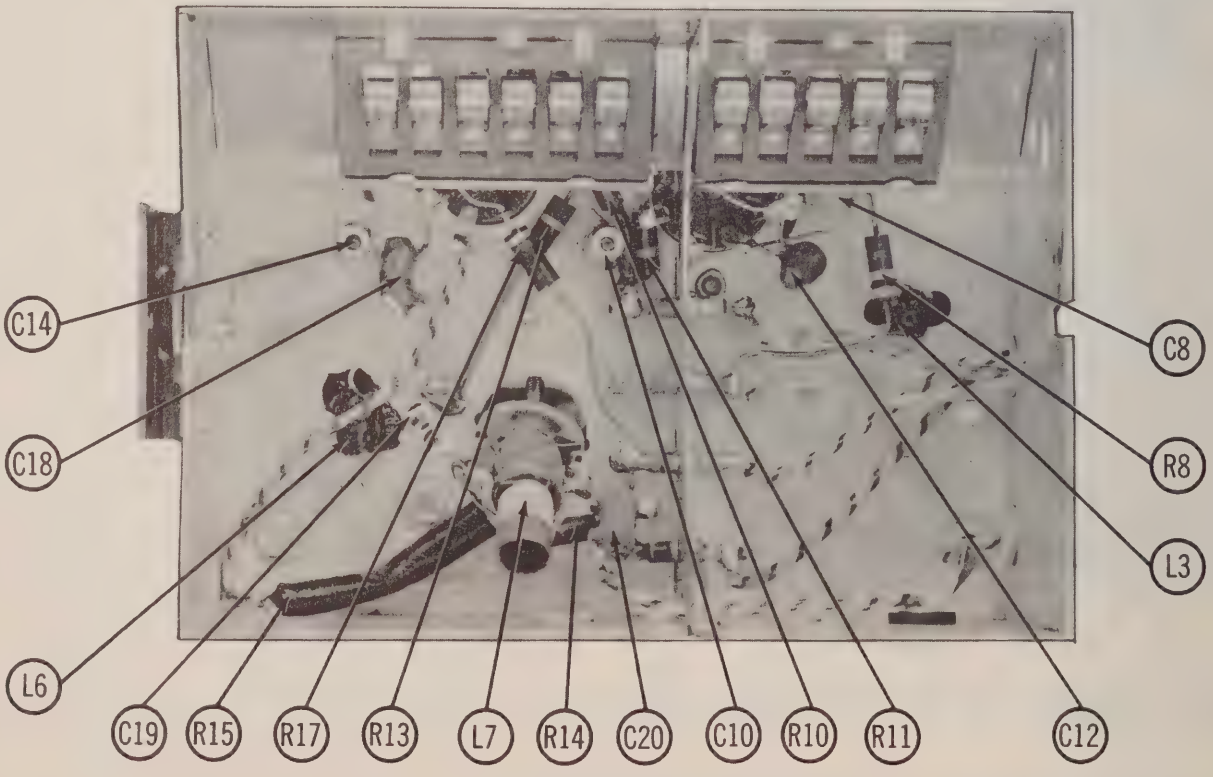
MEASURED WITH NOISY-NORMAL AREA SWITCH IN NORMAL AREA POSITION
† MEASURED FROM PIN 8 OF V20.
♦ MEASURED FROM PIN 5 OF V17.
MEASURED FROM PIN 3 OF V17.



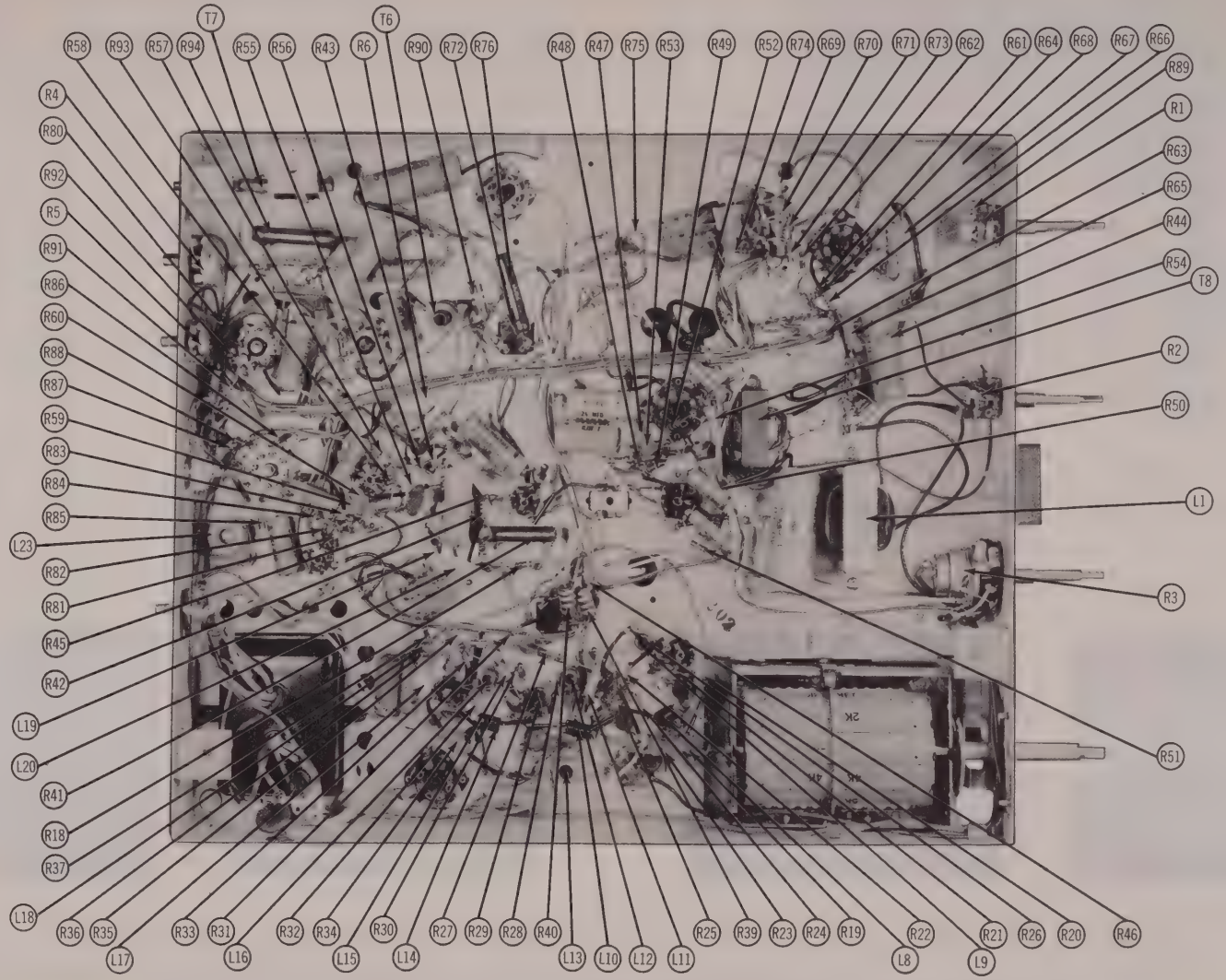
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Check horizontal yoke winding for open.
Check C81 for open.

INSUFFICIENT SWEEP

Substitute V15, V16 and V17. Check adjustment of horizontal drive, B2, horizontal linearity, B4 and width, B3. If these adjustments do not give sufficient sweep, check waveform at W12.

If Satisfactory	If Unsatisfactory
Check C82, C77, C78, C79, C81, and T3. Check C76 and R94.	Check C72 and C73. Check R90 and R88. Check other components associated with V15.

DRIVE LINES

Substitute V16 and V17. Check adjustment of horiz. drive, B2. Check C72. Check T3, C77, C78 and C79.

COMPRESSED AT LEFT SIDE

Substitute V15, V16 and V17. Check adjustment of horizontal linearity, width, and horizontal drive controls.
Check T3, C77, C78, C79, C81 and C82.

FOLDS

Substitute V16 and V17. Check T3, C77, C78 and C79.

XMAS TREE EFFECT (Fig. 1)

Substitute V15. Check C70 for open and L23 for short.

VERTICAL

LOSS OF SWEEP

Substitute V12 and V13. Check signal at W7.

If Satisfactory	If Unsatisfactory
Check T4, yoke and other components associated with V13.	Check C64, T2 and other components associated with V12B.

INSUFFICIENT SWEEP

Substitute V12 and V13. Check C64, C63, T2, T4, yoke, C4A and C4C.

COMPRESSED AT BOTTOM

Substitute V12 and V13. Check C4C and C4A.

COMPRESSED AT TOP

Substitute V12 and V13. Check C4C , T4 and yoke.

FOLDS

Substitute V12 and V13. Check C63 and C64. Check T4 and yoke.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V11, V12 and V14. Check C68 and C69. Check components associated with V14.

CRITICAL SYNC

Substitute V11, V12, V14 and V15. Procede as outlined under "Horizontal, Loss of Sync".

PULLING PICTURE (Fig. 2)

Substitute V14 and V15. Check C68 and C69.

PIE CRUST EFFECT (Fig. 3 and 4)

This trouble is caused by C69 being open.

VERTICAL

LOSS OF SYNC

Substitute V11 and V12. Check vertical integrator network and C62. Check video stages for signal overload and sync clipping.

CRITICAL SYNC

Substitute V11 and V12. Procede as outlined under "Loss of Sync".

TRIGGERING

Check the circuits of V11 and V12 for filament lead dress.

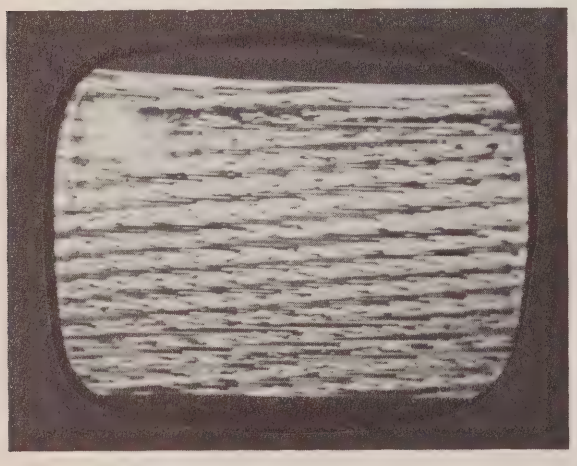


Fig. 1.

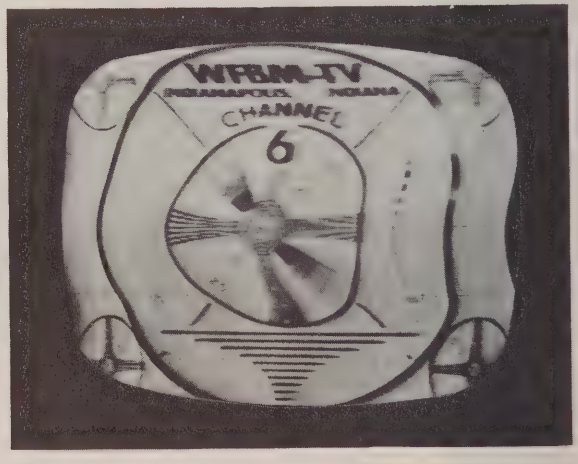
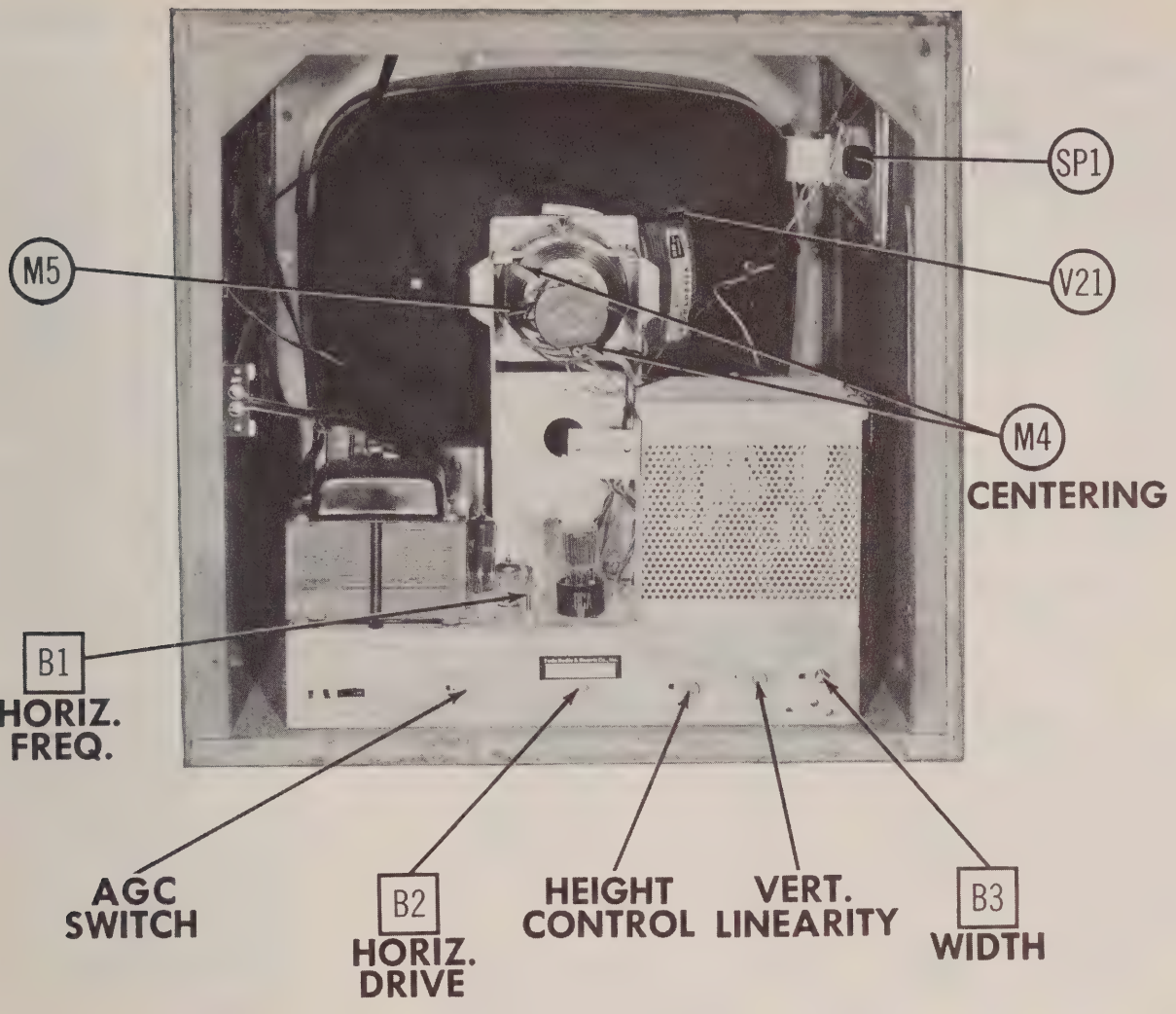


Fig. 2.



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression of the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: FADA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6BK7	6BK7	9AJ	
B	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J8	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V7A	Video Output	12BY7	12BY7	9BF	
B	Video Output	6AG7	6AG7	9Y	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V10	Audio Output	6K8GT	6K9GT	7S	
V11	Sync Separator - Sync Clipper	12AU7	12AU7	9A	
V12	Sync Phase Inv.-Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V13	Vert. Output	6S4	6S4	9AC	
V14	Horiz. AFC	6AL5	6AL5	6BT	
V15	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6CD6G	6CD6G	5BT	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: FADA PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V21	17HP4	17HP4	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FADA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	±50	475	23.79	AFH2-73		CO41		FP288	TVL-3843	
B	±40	475						TC82		
C2	40	450	22.82	PRS450/40		BR4045A		TC78	TVA-1712	
C3A	●80	350	22.80D	AFH3-153		BO68		FP450	TVL-3727	
B	±20	450		PRS350/10		BR1035				
C	±10	350								Note 1
C4A	±20	450	22.81	AFH4-80		DO53		FP437	TVL-4740	
B	±20	450								
C	100	50								
D	●20	450								
C5	5	50	22.56	PRS150/4		BR550		TC30	TVA-1303	
C6	35	50	22.66	PRS50/35		BR355A		TC36	TVA-1306	
C7	1	150	22.70	PRS150/4		BR145		TC40	TVA-1402	
C8	3-9				829-10					
C9	2.3			TCZ-2.3	829-3		NP0K-2R2		5TCCB-V22	
C10	.8-3							CT65A		
C11	120		SI30	D6-121	TM5T12	GP2K-121	UC-5312		5GA-T12	
C12	1000		BPD-001	DD-102	TM5D1	801-001	DC-521		5HK-D1	
C13	100		SI100	D6-101	TM5T1	GP1K-101	UC-531		5HK-D1	
C14	.5-3			829-3			CT65A			
C15	20		SI20NP0	TCZ-20		NP0K-200	UC-5421		5TCC-Q2	
C16	10		SU0N750	TCN-10		N750K-100	NT-541		5TCU-Q1	
C17	.5-3			829-3			CT65A			
C18	1000		BPD-001	DD-102	TM5D1	801-001	DC-521		5HK-D1	
C19	10		SU0N750	TCN-10		N750K-100	NT-541		5TCU-Q1	
C20	120		SI120	D6-121	TM5T12	GP2K-121	UC-5312		5GA-T12	
C21	5000		BPD-005	DD-502	TM5D5	811-005	DC-525		5HK-D5	
C22	1500		17.45	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C23	5000		17.44	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C24	120		17.106	SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C25	5000		17.44	BPD-005	DD-502	TM5D5	8H-005	DC-525	5HK-D5	
C26	5000		17.44	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C27	5000		17.44	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C28	120		17.106	SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C29	2		17.127							
C30	47		17.130	SI47NP0	TCZ-47		NP0K-470	CT-5447	5TCC-Q47	
C31	5000		17.44	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C32	5000		17.44	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C33	5000		17.44	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	5000		17.44	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C35	120		17.106	SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C36	120		17.106	SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C37	.1	200	12.49	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C38	.1	200	12.49	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C39	.01	400	13.72	P488-01	D6-103	PTE4SI	GP2-333-103	PT411	4TM-S1	
C40	3		17.131							
C41	5000		17.44	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C42	5		17.78	SI5	TCZ-4.7	5W5V5	GP1K-050	Z7-555	5GA-V5	
C43	680		17.108	SI680	D6-681		GP2K-681	UC-5368	5GA-T68	
C44	470		17.107	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C45	.1	600	12.50	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C46	.1	400	13.75	P488-1		PTE4P1		PT401	4TM-P1	
C47	2		17.59							
C48	39		17.105	SI39	D6-390	5W5Q4	GP1K-390	UC-5439	5GA-Q39	
C49	10000		17.80	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C50	620	500	17.125							
C51	.0039	400	12.71	P488-004	D6-392	PTE6D4	GP2-333-392	PT634	6TM-D4	
C52	.01	400	12.72	P488-01	D6-103	PTE4SI	GP2-333-103	PT411	4TM-S1	
C53	.0047	400	12.68	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C54	.0047	400	12.68	P488-0047	D6-472	PTE6D47	GP2-333-472	PT6347	6TM-D47	
C55	.022	400	12.83	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	

CAPACITORS (CONT.)

ITEM No	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FADA PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL-DUBILIER PART No	ERIE PART No.	MALLORY PART No	SPRAGUE PART No	NOTES
C56	.0047	400	12.83	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C57	.047	400	12.87	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C58	.022	400	12.82	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C59	10000		17.80	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C60	.47	200	12.92	P208-47		PJ2P5		PT405	2TM-P47	
C60A	.002			P688-002		PTE6D2		PT622		
B	.005		●167.1	P688-005	●PC-10●	PTE6D5	●1405-01	PT625	●10IC1	
C	.005			P688-005		PTE6D5		PT625		
C61	.0047	600	12.68	P688-0047		PTE6D47		MCB405	MS-25	
C62	.047	400	12.87	P488-047		PTE4S47		PT4147	4TM-S47	
C63	.1	400	12.75	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C64	1000		17.109	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C65	1000		17.109	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C66	1000		17.109	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C67	.01	400	12.72	P488-01	D6-103	PTE4SI	GP2-333-103	PT411	4TM-S1	
C68	.0047	400	12.68	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C69	.047	400	12.87	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C70	3900	500	17.113	1404-004		IDR5D4		MCB433	MS-24	
C71	330	500	17.09	1405-00035						
C72	390	500	17.38	1409-0004		5RST4		MCB243	MS-34	
C73	270	500	17.123	1409-0003		5RST3		MCB241	MS-33	
C74	20	1500	17.124		D18-200	TM60Q2			15GAB-Q2	
C75	20	1500	17.124		D18-200	TM60Q2			15GAB-Q2	
C76	.047	500	12.86	P588-047	DF-503	PTE5S47		PT5147	5TM-S47	
C77	.22	400	12.77	P488-22		PTE4P22		PT4025	4TM-P22	
C78	.047	400	12.87	P488-047		PTE4S47		PT4147	4TM-S47	
C79	.033	400	12.94	P488-033				PT4133		
C80	50	1500	17.122						15GAB-Q56	
C81	.22	400	12.77	P488-22		PTE4P22		PT4025	4TM-P22	
C82	1	200		484-1.0		PJ2W1		PT41	2TM-M1	Note 2
C83	500	20000	17.118	HV30C	TV3-502	MM-C4DT5	413-501		20DK-T5	
C84A	10000		17.136	BPD-01	DD-3-103	TM5D81	821-01	DCD-525	5HK-Z81	
B	10000			BPD-01			821-01			

Note 1. When C3C is 350V section, R38 is omitted.
Note 2. Some Models use .68FD in this application (Part #12.115)
● Items C61A, C61B, C61C, R67A, R67B, R67C are combined in one unit.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FADA PART No.	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 MΩ	½	52.66	QJ-168 *	RTV-110	SBB-510	UF16L	Vert. Hold-Panel
B	50KΩ	½					UR54L	Horiz. Hold-Rear
R2A	500KΩ	½	52.70	QJ-436**	RTV-401		UF55A	Tone-Panel
B	50KΩ	½					UR54L	Brightness- Rear
R3A	750Ω	2	52.64	QJ-270*	RTV-109		WF75-T25	Contrast-Top & 500Ω-Wire Wound-Panel
B	500KΩ	½					UR55A	Volume-Rear
C	Switch						UR-28	Attach to R3B
R4A	5000Ω	2	52.68	WK-5000	A43-5000	VK-135	R5000L	Vert. Linearity-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A
R5A	2.5Meg	½	52.24	QJ1-239	AG-84-S	AB-83	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	2.5Meg	½	52.74	QJ1-239	AG-84-S	AB-83	SU-565	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A

* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B11-137 & P1-126 (Panel)
B11-123 & R1-212 (Rear).
** CONCENTRIKIT EQUIVLENT-KIT K-2, BASE ELEMENTS & SHAFTS B13-133 & P1-126 (Panel)
B11-123 & R1-209 (Rear).
● CONCENTRIKIT EQUIVALENT-KIT K-3, BASE ELEMENTS & SHAFTS W17-105X & P4-124 (Panel)
B13-133 & R1-212 (Rear) & SWITCH 76-1.
† UNIVERSAL REPLACEMENT (MALLORY EXACT DUPLICATE PART NO. UE1601).
†† UNIVERSAL REPLACEMENT (MALLORY EXACT DUPLICATE PART NO. UE22W8).
§ UNIVERSAL REPLACEMENT (MALLORY EXACT DUPLICATE PART NO. UE1425).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FADA PART No	IRC PART No	NOTE
R7	22KΩ	½		BTS-22K	
R8	47KΩ	½			
R9	220KΩ	½			
R10	1000Ω	½		BTS-1000	
R11	180KΩ-5%	½			
R12	4700Ω	½		BTS-4700	
R13	220KΩ	½			
R14	15KΩ	½		BTS-15K	
R15	10Ω	½			
R16	10KΩ	½			
R17	10KΩ	½			
R18	470Ω	½		BTS-470	
R19	330Ω	½		BTS-330	
R20	10KΩ	½	32.11	BTS-10K	
R21	47Ω	½	32.197		
R22	100Ω	½	32.2	BTS-100	
R23	330Ω	½	32.67	BTS-330	
R24	8200Ω	½	32.77	BTS-8200	
R25	47Ω	½	32.197		
R26	100Ω	½	32.2	BTS-100	
R27	100Ω	½	32.2	BTS-100	
R28	5600Ω	½	32.126	BTS-5600	
R29	120Ω	½	32.116	BTS-120	
R30	10KΩ	½	32.11	BTS-10K	
R31	100Ω	½	32.2	BTS-100	
R32	1 Meg	½	32.33	BTS-1 Meg	
R33	680KΩ	½	32.35	BTS-680K	
R34	39KΩ	½	32.103	BTA-39K	
R35	560Ω	½	32.126	BTS-5600	Note 1
R36	1 Meg	½	32.33	BTS-1 Meg	
R37	82Ω	½	32.125		Note 2
R38	82KΩ	½	32.42	BTA-82K	Note 3
R39	39KΩ	2	32.660	BTB-39K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FADA PART No	IRC PART No	NOTES
R40	39KΩ	2	32.660	BTB-39K	
R41	5000Ω	10	117.80	1 3/4A-5000	
R42	470KΩ	½	32.62	BTS-470K	
R43	330KΩ	½	32.205	BTS-330K	
R44	22KΩ	½	32.103	BTS-22K	
R45	47KΩ	½	32.15		
R46	4700Ω	½	32.74	BTA-4700	
R47	15KΩ	½	32.12	BTS-15K	
R48	22KΩ	½	32.13	BTS-22K	
R49	22KΩ	½	32.13	BTS-22K	
R50	10Meg	½	32.99	BTS-10Meg	
R51	220KΩ	½	32.18	BTS-220K	
R52	470KΩ	½	32.92	BTS-470K	
R53	680Ω	½	32.115	BTA-680	
R54	470Ω	½	32.399	BTA-470	
R55	1.8Meg	½	32.208	BTS-1.8Meg	
R56	33KΩ	½	32.14	BTS-33K	
R57	10KΩ	½	32.11	BTS-10K	
R58	47KΩ	½	32.15	BTS-47K	
R59	1.8Meg	½	32.208	BTS-1.8Meg	
R60	39KΩ	½	32.103	BTA-39K	
R61	6.8Meg	½	32.46	BTS-6.8Meg	
R62	1000Ω	½	32.6	BTS-1000	
R63	2200Ω	½	32.60	BTS-2200	
R64	12KΩ	½	32.142	BTS-12K	
R65	68KΩ	½	32.41	BTA-68K	
R66	2200Ω	½	32.60	BTS-2200	
R67A	22KΩ	½		BTS-22K	
B	8200Ω	½	●167.1	BTS-8200	
C	8200Ω	½		BTS-8200	
R68	1.5Meg	½	32.147	BTS-1 Meg	
R69	1 Meg	½	32.33	BTS-1 Meg	
R70	2.2Meg	½	32.34	BTS-2.2Meg	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FADA PART No	IRC PART No	NOTE
R71	47KΩ	½	32.15	BTS-47K	
R72	47KΩ	½	32.15	BTS-47K	
R73	8200Ω	½	32.77	BTS-8200	
R74	2.2Meg	½	32.34	BTS-2.2Meg	
R75	330Ω	½	32.67	BTS-330	
R76	7500Ω	10	117.81	1 3/4A-7500	
R77	560Ω	½	32.68	BTS-560	
R78	560Ω	½	32.68	BTS-560	
R79	1000Ω	½	32.8	BTS-1000	
R80	6800Ω	½	32.10	BTS-6800	
R81	100KΩ	½	32.39	BTS-100K	
R82	100KΩ	½	32.39	BTS-100K	
R83	4.7Meg	½	32.98	BTS-4.7Meg	
R84	470KΩ	½	32.92	BTS-470K	
R85	560Ω	½	32.126	BTS 560Ω	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FADA PART No	IRC PART No	NOTES
R86	12000-6%	½	32.263	BTS-12000-5%	
R87	100KΩ	½	32.89	BTS-100K	
R88	150KΩ	½	32.90	BTS-150K	
R89	47KΩ	½	32.15	BTS-47K	
R90	15KΩ	2	32.655	BTH 15K	
R91	470KΩ	½	32.92	BTS 470K	
R92	100Ω	½	32.2		
R93	100Ω	2	32.635	BW-2-100	
R94	17.5KΩ	10	117.71	1 3/4A-17.5K	
R95	2.2Ω	½	32.62		
R96	100KΩ	½	32.373		
R97	500Ω	20	117.74	2D-500	
R98	500Ω	20	117.74	2D-500	
R99	500Ω	20	117.74	2D-500	
R100	25000Ω	25	117.83	41E-2500	

Note 1. Some models may use a 8200Ω resistor in this application.
Note 2. Some models may use a 120Ω resistor in this application.
Note 3. Some models may use a 39KΩ resistor in this application.
● Items R67A, R67B, R67C, C61A, 61B C61C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: FADA PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	RCA TYPE No.
T1	117VAC @ 2.26A	730VCT, 240ADC	5VAC @ 6V	6.3VAC @ 1.2A SEC. 4 6.3VAC @ 8.9A	42.61	P-8188①	P-3059②	TP-360	R-37BC	20TT18③

① Parallel the two 6.3V, 5A windings, and use as Sec. 4.
② Parallel the two 5V windings and use as Sec. 2.
③ Drill new mounting holes, file cut out.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI	RATING: DC RESISTANCE SEC	REPLACEMENT DATA: FADA PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	RCA TYPE No.	NOTES
T2	130Ω	1000Ω	42.53	A-8111	A-3000	TBO-5 ⑤	A-97X	208T2	Vert. Osc. Trans.
T3	275Ω Tap @ 50Ω @ 35Ω	60Ω Tap @ 5Ω	37.255B	A-4130	HVO-10	TFD-7	D-15 ⑤		Horiz. Output Trans.
		SEC. 2 0.7Ω	37.255 ②						
		SEC. 3 0Ω							
		SEC. 4 6Ω							
T4	1480Ω Tap @ 10.5Ω		42.62	A-8123	A-3037	TSO-8 ⑥	A-102X	222T1	Vert. Output Trans.
T5A	14Ω		37.261	DY-8A	MDF-70	TY-3	Y-17	206D1	Horiz. Deflection Coils
B	65Ω								Vert. Deflection Coils.
T6	150Tap @ 4.8Ω		37.250						Horiz. Lin. Coil
T7	2.3Ω		37.248		MWC-37		WC-12 ④	206R1	Width Coil

① Drill one new mounting hole.
② Alternate horiz. output trans.
③ Use with width coil WC-11.
④ See instruction (Schematic 3 & 5A) sheet packed with unit for terminal connections
⑤ Use with width coil WC-11.
⑥ Connect as auto -trans.
⑦ Enlarge mounting hole.
⑧ Connect to coded blue and green dot terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI	RATING: IMPEDANCE SEC	RATING: DC RES. PRI	RATING: DC RES. SEC	REPLACEMENT DATA: FADA PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	NOTES
T8	4.5KΩ	2.8Ω	375Ω	.4Ω	42.57	A-3877	A-2930	RO-8	S-3X	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V C IMP	REPLACEMENT DATA: FADA PART No.	JENSEN PART No	QUAM PART No	NOTES
SP1	6"	PM	2.6Ω	107.46	8T-108 Mod. P8 X	6A1	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 ~/1	REPLACEMENT DATA: FADA PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No
L1	.240ADC	90Ω	1.5 Hy.	42.56	C-2326 ①	C-2996 ①	TR-1733 ①§	C-17X ①

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES PRI	DC RES SEC	REPLACEMENT DATA: FADA PART No	MILLER PART No	MEISSNER PART No	NOTES
L2	Ant. Coils	0Ω	CT 0Ω				
L3	Fil. Choke	0Ω					
L4	Neutr.Coil	0Ω					
L5	RF, Mixer Grid & Osc. Coils	0Ω					
L6	Fil. Choke	0Ω					
L7	1st. Video IF	.9Ω					

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)(CONT.)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	FADA PART No.	MILLER PART No.	MEISSNER PART No.	
L8	Fil. Choke	0Ω		37.89	6175	19-3001	
L9	2nd. Video IF	.2Ω		37.99	6188 *	17-1003	
L10	Fil. Choke	0Ω		37.89	6175	19-3001	
L11	RF Choke	1.8Ω		37.197	4612		13 Microhenries
L12	3rd. Video IF	.2Ω		37.99	6189 *	17-1004	
L13	Sound Trap	0Ω		37.268	6171	19-1020	
L14	Fil. Choke	0Ω		37.89	6175	19-3001	
L15	RF Choke	1.8Ω		37.197	4612		13 Microhenries
L16	4th. Video IF	.2Ω		37.99	6188 *	17-1003	
L17	Series Peaking Coil	5Ω		37.234		19-3125	120 Microhenries
L18	Shunt Peaking Coil	12.5Ω		37.235	4650		600 Microhenries
L19	Series Peaking Coil	6Ω		37.236	6180 ■	19-3180 ■	190 Microhenries, wound on 18KΩ resistor
L20	Shunt Peaking Coil	7.5Ω		37.237	6181	19-3250	245 Microhenries
L21	Sound IF	2Ω	2Ω	37.252	6203		
L22	Ratio Det.	5.5Ω	2Ω CT	37.253	6205		Tertiary Winding -.6Ω
L23	Horiz. Osc.	62Ω		37.233	6210	19-1576	

* Enlarge mounting hole.
■ Parallel with 18KΩ resistor

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FADA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T	1/4A 250V			318.250 (3AG-1/4A P/T)		GJV 1/4	

MISCELLANEOUS

ITEM No.	PART NAME	FADA PART No.	NOTES
M2	RF Tuner	42.71	Complete with tube
M3	Switch		AGC Selecto r
M4	Centering Magnet	112.37	
M5A	Ion Trap	112.39	
B	Ion Trap	112.26	Used with 17BP4 picture tube.
M6	Focus Magnet	132.18	Used with 17BP4 picture tube.
B2	Trimmer		
	Capacitor	132.18	Horiz. Drive, 25-280MMF
	Cabinet	97.454	Model 17T6
	Cabinet	97.484	Model 17T9
	Back	97.457	Model 17T6
	Back	97.488	Model 17T9
	Safety Glass	92.498	Model 17T6
	Safety Glass	92.544	Model 17T9
	Mask	97.456-1	Model 17T6
	Mask	97.487	Model 17T9
	Escutcheon	92.381-1	
	Knob	142.91	Channel Selector
	Knob	142.92	Fine Tuning
	Knob	142.94	Tone, Contrast, Vert. Hold
	Knob	142.93	Off/On Volume, Brightness, Horiz. Hold

TROUBLE SHOOTING AIDS (CONT.)

PROPERTY OF
BLANKENSHIP
DENVER, COLORADO

VIDEO

SOUND BARS

Check adjustment of sound take-off trap, A6 and A7. Check setting of local oscillator.

POOR RESOLUTION

Check video IF alignment as outlined in the alignment table.

POOR CONTRAST

Substitute V6 and V7. Check C45 and other components of the video detector and video output stages. Check picture tube.

SMEAR

Substitute V6 and V7.
Check L19 for open. Check R39, R40 and R41 for change of value.

ONE BLACK BAR ACROSS PICTURE

Check RF Tuner, video IF, video detector and video output tubes for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Substitute V8, V9 and V10. Check alignment of Sound IF and Ratio detector.

BUZZ

Check adjustment of Ratio detector, A9. If buzz is still present, substitute V9 and readjust A9.

DISTORTED

Check adjustment of Sound IF, A8, A7 and A6.
Check Ratio detector adjustment, A9.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Substitute V17, V18, V16 and V15. Check R95 and R96. Check C83, C76, C77, C78 and C79. Check T3 and other components of the horizontal output stage.

WEAK HIGH VOLTAGE

Substitute V18, V17, V16 and V15. Procede as outlined under "Loss of High Voltage".

BLOOMING

Substitute V18 and V19. Check R95, R96 and C83.
Check picture tube for gassy condition.

POWER

DIM PICTURE

Substitute V19 and V20. Check picture tube.

SMALL RASTER, WEAK SOUND

Substitute V19 and V20. Check B plus. If low check B plus circuits for shorts. Check C1, C2 and C3A.

GENERAL

RASTER, NO SOUND, NO PICTURE

Substitute V1, V2, V3, V4, V5, V6 and V7. Check RF tuner, video IF, video detector and video amp. circuit and components.

INTERMITTANT STREAKS

Check high voltage section for corona discharge and arcing.

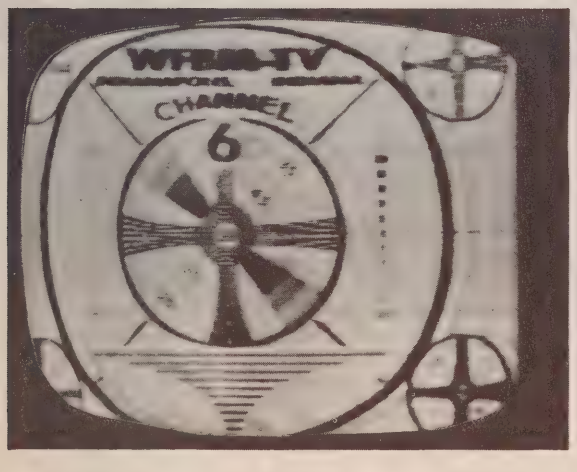


Fig. 3.

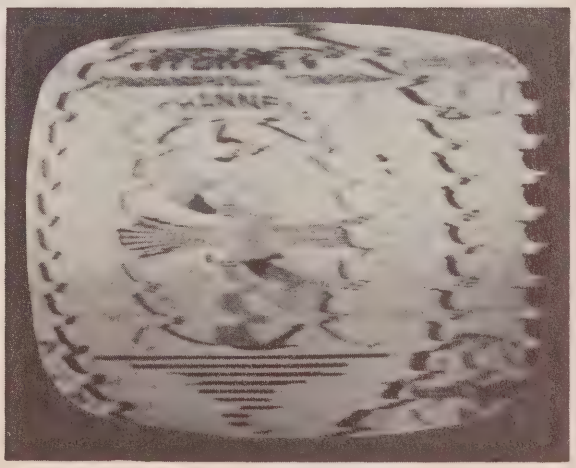


Fig. 4.

The Trouble - Shooting photographs shown above are made with permission of transmitting station WFBM-TV and in no way reflect the quality of the transmitted picture. Similarly, symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch up adjustment of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

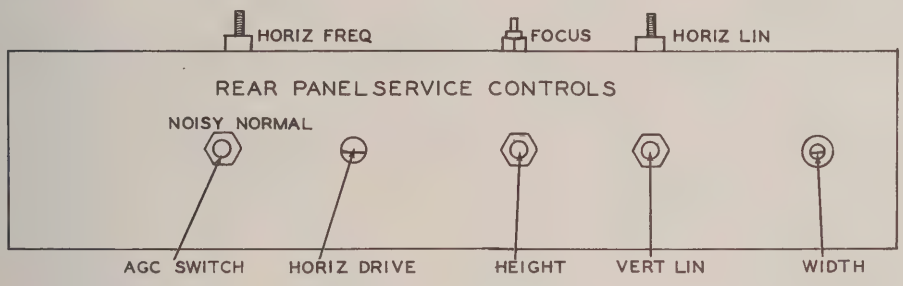
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of the range and adjust the Horiz. Freq. slug L23 until the picture synchronizes horizontally.(For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L22 located on top of the chassis. (See tube placement chart).

FUSES

One fuse is used for Horiz. Sweep Circuit protection. (For location,see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 8 push on type control knobs from front panel.
2. Remove 9 wood screws. Remove rear cover.
3. Disconnect built-in antenna & speaker.
4. Remove 2 wood screws. Remove antenna bracket.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker. (Not necessary for chassis removal).

PHOTOFACT* Folder

MIRRORTONE MODELS 17PCSB, PCW, PTE, 20PCSB, PCW, PTE, PTS, PTSB, PTW, TPRSB, 21PCS, QDCS, 24QDCS

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MODEL 20PTS

MIRRORTONE MODELS 17PCSB, PCW, PTE, 20PCSB, PCW, PTE, PTS, PTSB, PTW, TPRSB, 21PCS, QDCS, 24QDCS

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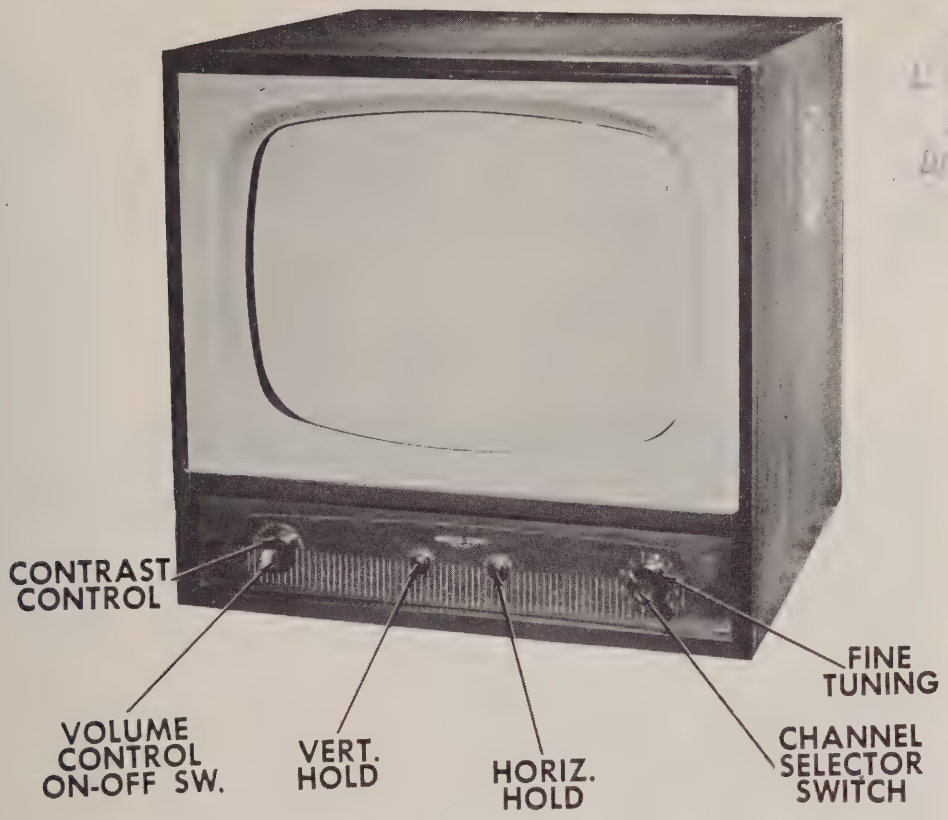
MIRRORTONE MODELS 17PCSB, PCW, PTE, 20PCSB, PCW, PTE, PTS, PTSB, PTW, TPRSB, 21PCS, QDCS, 24QDCS



MIRRORTONE MODEL 20PTS (Ch. 9034A)

TRADE NAME	Mirrortone Models 17PCSB, 17PCW, 17PTE, 20PCSB, 20PCW, 20PTE, 20PTS, 20PTSB, 20PTW, 20TPRSB, 21PCS, 21QDCS, 24QDCS (Ch. 9033, 9034, 9034A)
MANUFACTURER	John Meck Industries, Plymouth, Indiana
TYPE SET	Television Receiver
TUBES	Nineteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.68 Amp. @ 117 Volts
TUNING RANGE	Channesl 2 thru 13, Video IF 26.1MC, Sound IF 21.6MC (Intercarrier)

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MIRRORTONE MODELS 17PCSB, PCW, PTE, 20PCSB, PCW, PTE, PTS, PTSB, PTW, TPRSB, 21PCS, QDCS, 24QDCS

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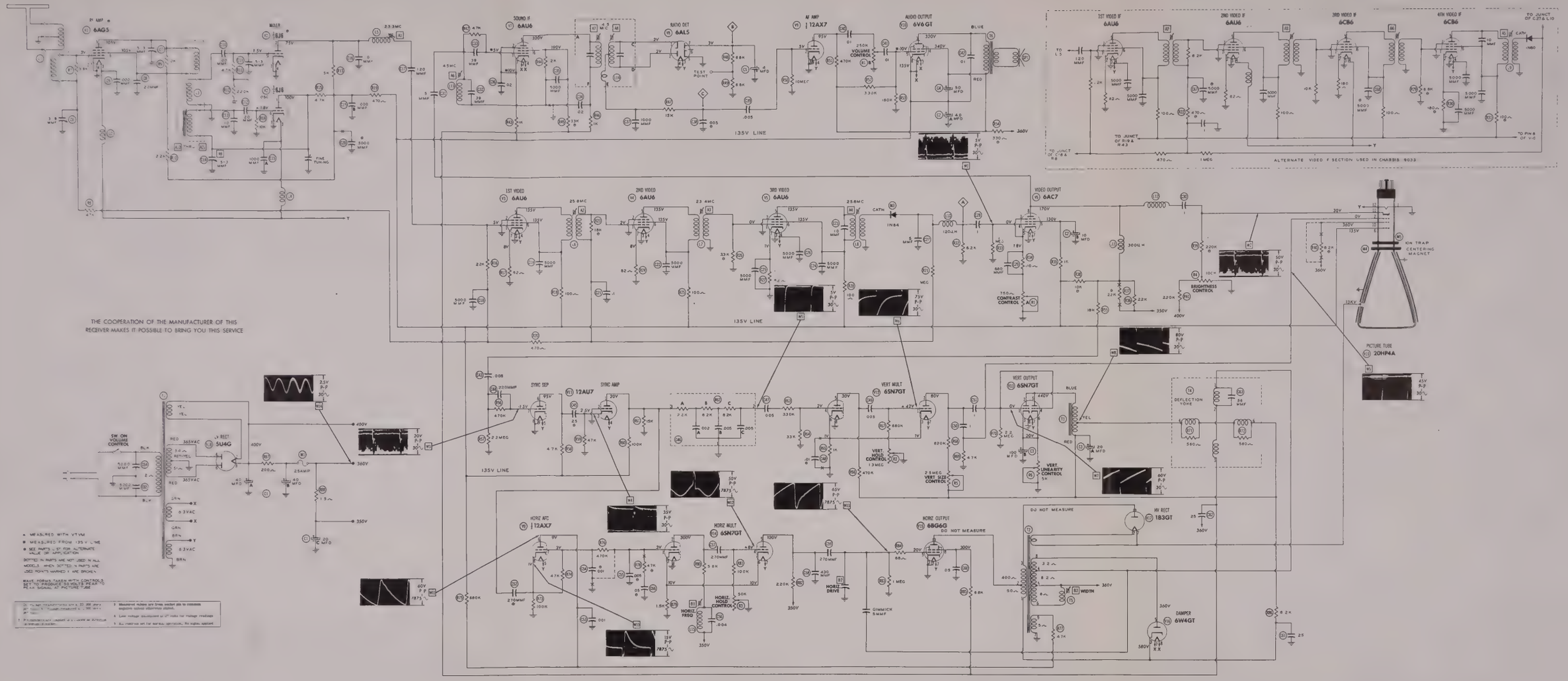
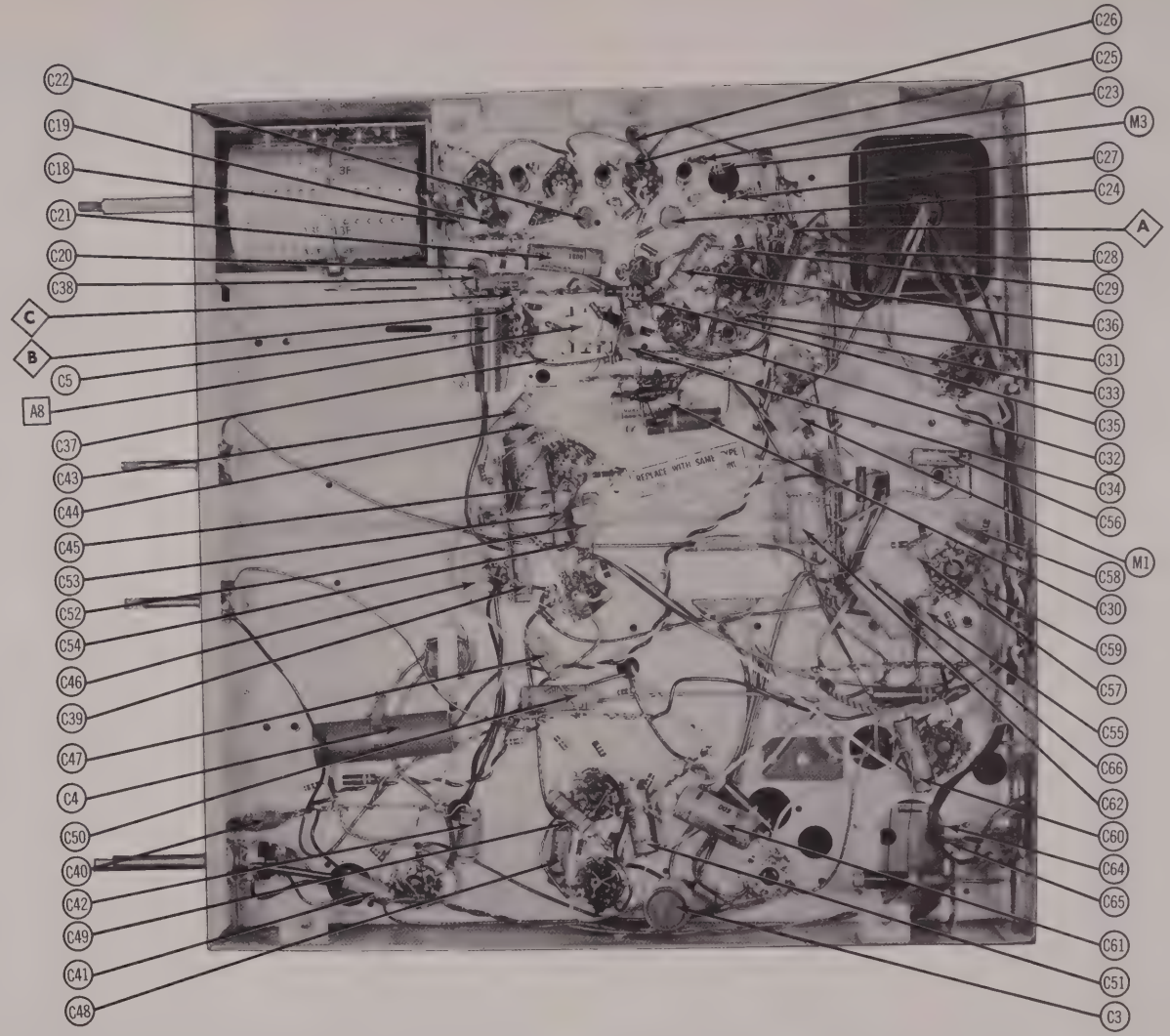


MIRRORTONE MODELS 17PCSB, PCW, PTE, 20PCSB, PCW, PTE, PTS, PTSB, PTW, TPRSB, 21PCS, QDCS, 24QDCS

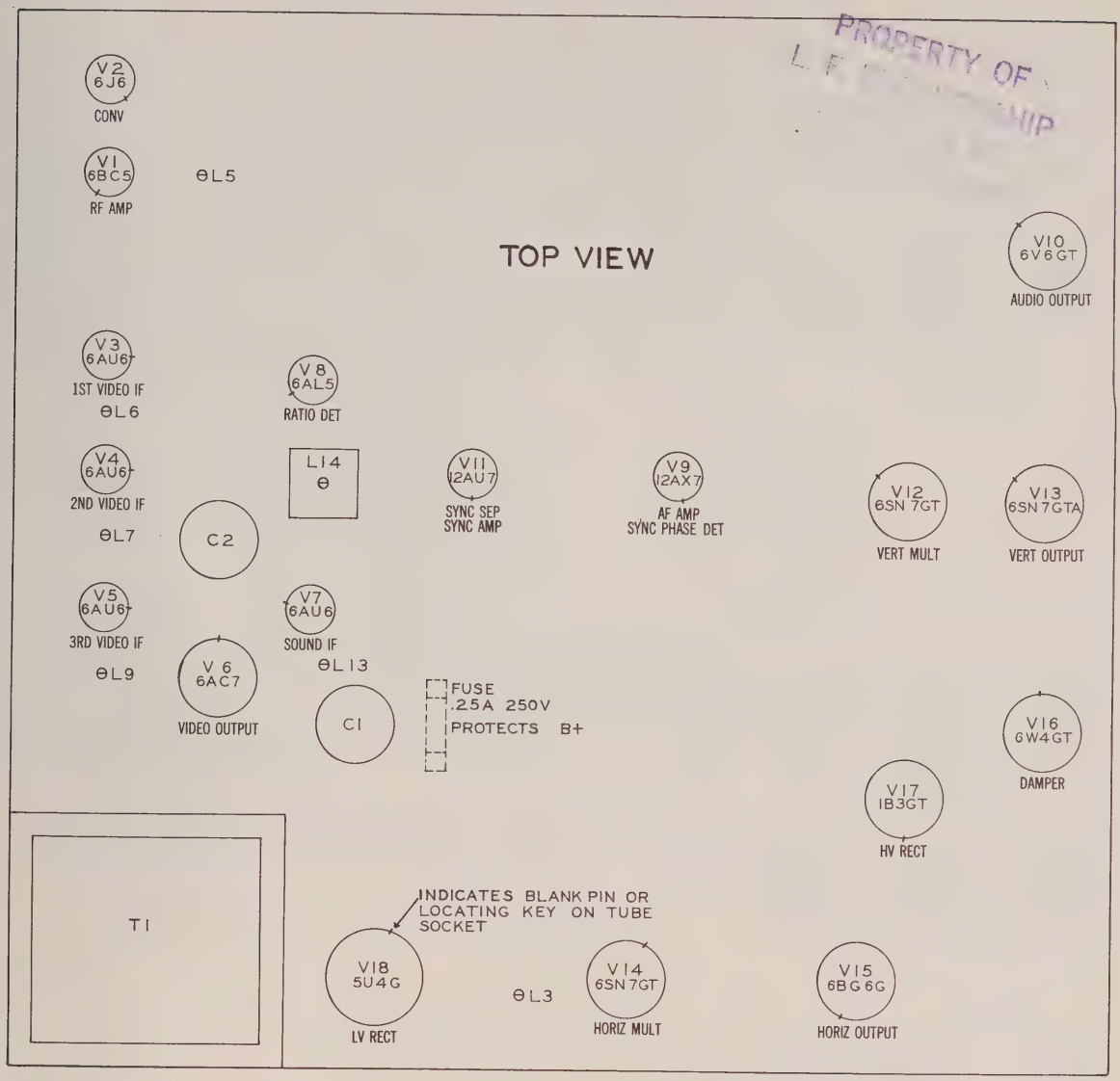
MIRRORTONE MODELS 17PCSB, PCW, PTE, 20PCSB, PCW, PTE, PTS, PTSB, PTW, TPRSB, 21PCS, QDCS, 24QDCS

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V18, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster- V2, V3, V4, V5, V6, V10
No pic, no sound, has snow- V1, V2, V3
No pic, has sound, has raster - V6, V19
Has pic, no sound - V7, V8, V9, V10

SYNC FAILURE
No vert. sync - V11, V12
No horiz. sync - V9, V11, V14
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound - V14, V15, V16, V17, V19
No vertical deflection - V12, V13
Poor vert. linearity or foldover - V12, V13
Poor Horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, V17, V18
Vert. Off Freq. - V11, V12
Horiz. Off Freq. - V9, V11, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.
Individual receivers may employ one of three variations in the video IF strip.
The first is identified by a 3 stage video IF strip. Alignment frequencies appear in the tables unmarked.
Another variation using a 4 stage video IF strip is identified by the grid load resistors of the last two stages, both being 6800Ω.
Alignment frequencies for this variation will be indicated in the tables by an asterisk (*).
The third variation, also a 4 stage video IF strip employs a 10KΩ third IF grid resistor and 6800Ω for the fourth stage. The second IF grid return includes a 470Ω resistor bypassed to chassis with a .005MFD capacitor. Alignment frequencies will be indicated by a dagger (†).
Adjustment A5 will be missing from the first variation alignment.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23.3MC * 25.9MC †25.8MC	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection. Adjust generator output to maintain 1 volt at VTVM.
2.	"	"	25.8MC * 25.6MC † 24.4MC	"	"	A2	"
3.	"	"	23.4MC * 23.1MC † 22.8MC	"	"	A3	"
4.	"	"	25.6MC *22.9MC †23.2MC	"	"	A4	"
5.	"	"	*24.4MC †25.4MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.6MC 22.7MC 26.1MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A1 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 4 (grid) of 6AC7 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A6, A7	Adjust for maximum deflection. Attenuate generator output to maintain less than 5 volts at VTVM.
8.	"	"	"	"	DC probe to point (C). Common to Test Point.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 4 (grid) of 6AC7 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A6, A7	Dosconnect stabilizer capacitor C5. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
8.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A8	Reconnect capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

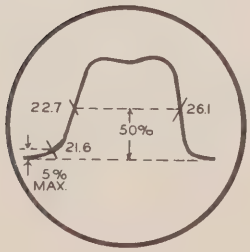


FIG. 1

FIG. 2

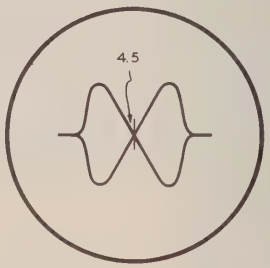


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A9.
It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel.
If adjustment of A9 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A10	Adjust to place video marker at 50% on low frequency side of response curve.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A11	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A12	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A13	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A14	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A15	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A16	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A17	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A18	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A19	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A20	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A21	

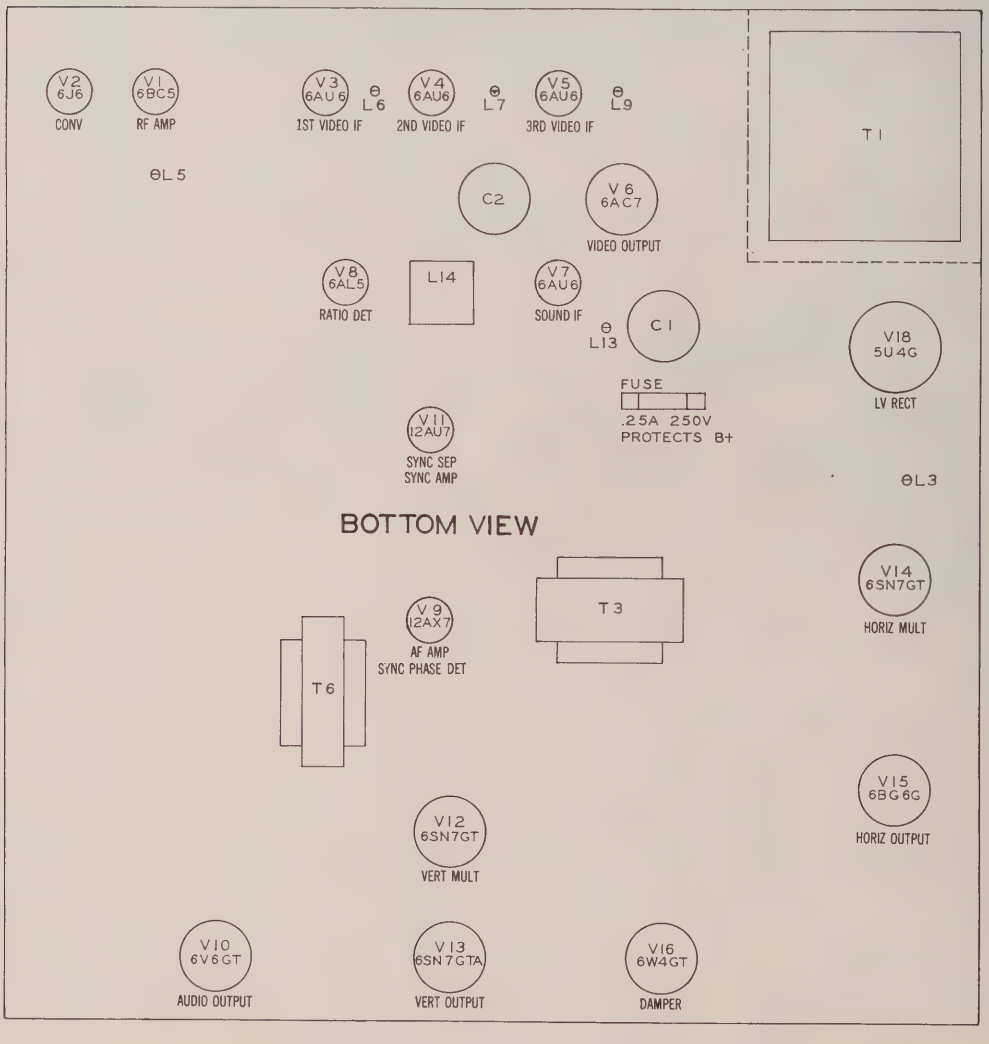
RF AND MIXER ALIGNMENT

The RF and mixer portion of this receiver has been correctly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

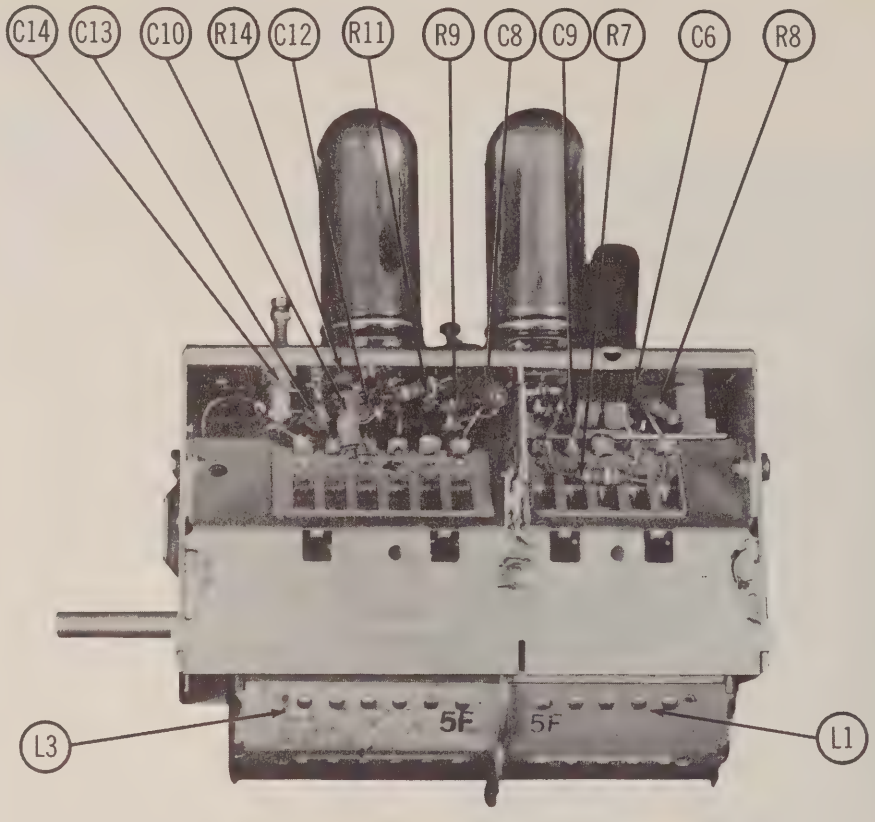
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.1Meg	INF	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	0Ω		
V 2	6J6	†5.1KΩ	†15.4KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	1 Meg	0Ω	0Ω	.1Ω	†100Ω	†100Ω	82Ω		
V 4	6AU6	1 Meg	0Ω	0Ω	.1Ω	†100Ω	†100 Ω	82Ω		
V 5	6AU6	.2Ω	0Ω	0Ω	.1Ω	†100Ω	†100Ω	82Ω		
V 6	6AC7	0Ω	0Ω	220Ω	1 Meg	220Ω	†1KΩ	.1Ω	‡9.5KΩ	
V 7	6AU6	†48KΩ	†1KΩ	†0Ω	†0Ω	†35KΩ	†13KΩ	†1KΩ		
V 8	6AL5	INF	INF	.1Ω	0Ω	0Ω	INF	15KΩ		
V 9	12AX7	‡470KΩ	10Meg	0Ω	.1Ω	.1Ω	47KΩ	147KΩ	100KΩ	0Ω
V 10	6V6GT	INF	†0Ω	‡900Ω	‡530Ω	180KΩ	INF	†.1Ω	‡22KΩ	
V 11	12AU7	15KΩ	0Ω	47KΩ	.1Ω	.1Ω	†4.7KΩ	2.6Meg	0Ω	0Ω
V 12	6SN7GT	1.6Meg	▲2.5Meg	1 KΩ	33KΩ	▲480KΩ	1KΩ	.1Ω	0Ω	
V 13	6SN7GTA	2.2Meg	▲8.2KΩ	1.5KΩ	2.2Meg	▲8.7KΩ	1.5KΩ	.1Ω	0Ω	
V 14	6SN7GT	600KΩ	‡7.3KΩ	1.5KΩ	120KΩ	‡220KΩ	1.5KΩ	.1Ω	0Ω	
V 15	6BG6G	0Ω	0Ω	0Ω	47KΩ	1 Meg	INF	.1Ω	‡15KΩ	Top Cap ▲50Ω
V 16	6W4GT	INF	INF	190KΩ	INF	‡200Ω	INF	†0Ω	†.1Ω	
V 17	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ▲450Ω
V 18	5U4G	INF	40KΩ	INF	54Ω	INF	51Ω	INF	40KΩ	
V 19	20HP4A	0Ω	4.7KΩ	Pin 6 †0Ω	Pin 10 ‡8.2KΩ	Pin 11 230KΩ	Pin 12 .1Ω			

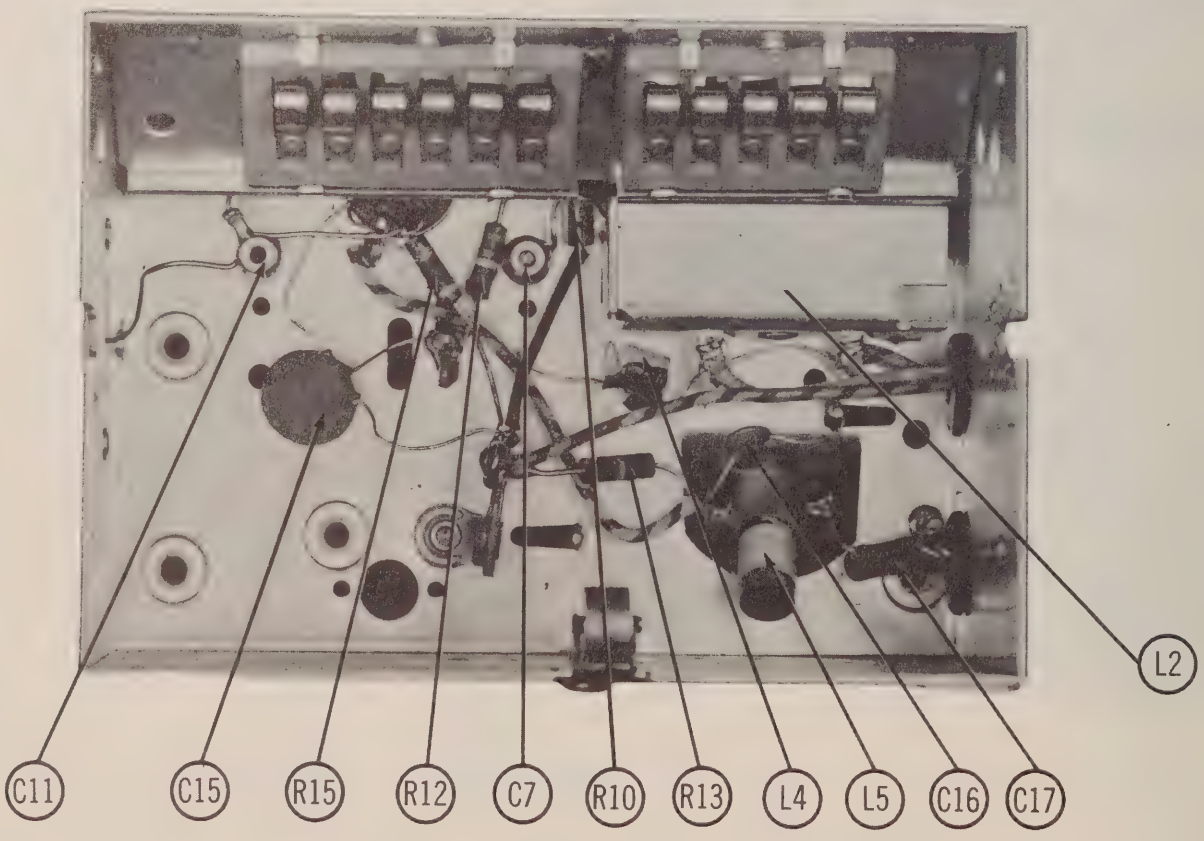
† MEASURED FROM 135VDC LINE
‡ MEASURED FROM PIN 8 of V18.
▲ MEASURED FROM PIN 3 of V16.



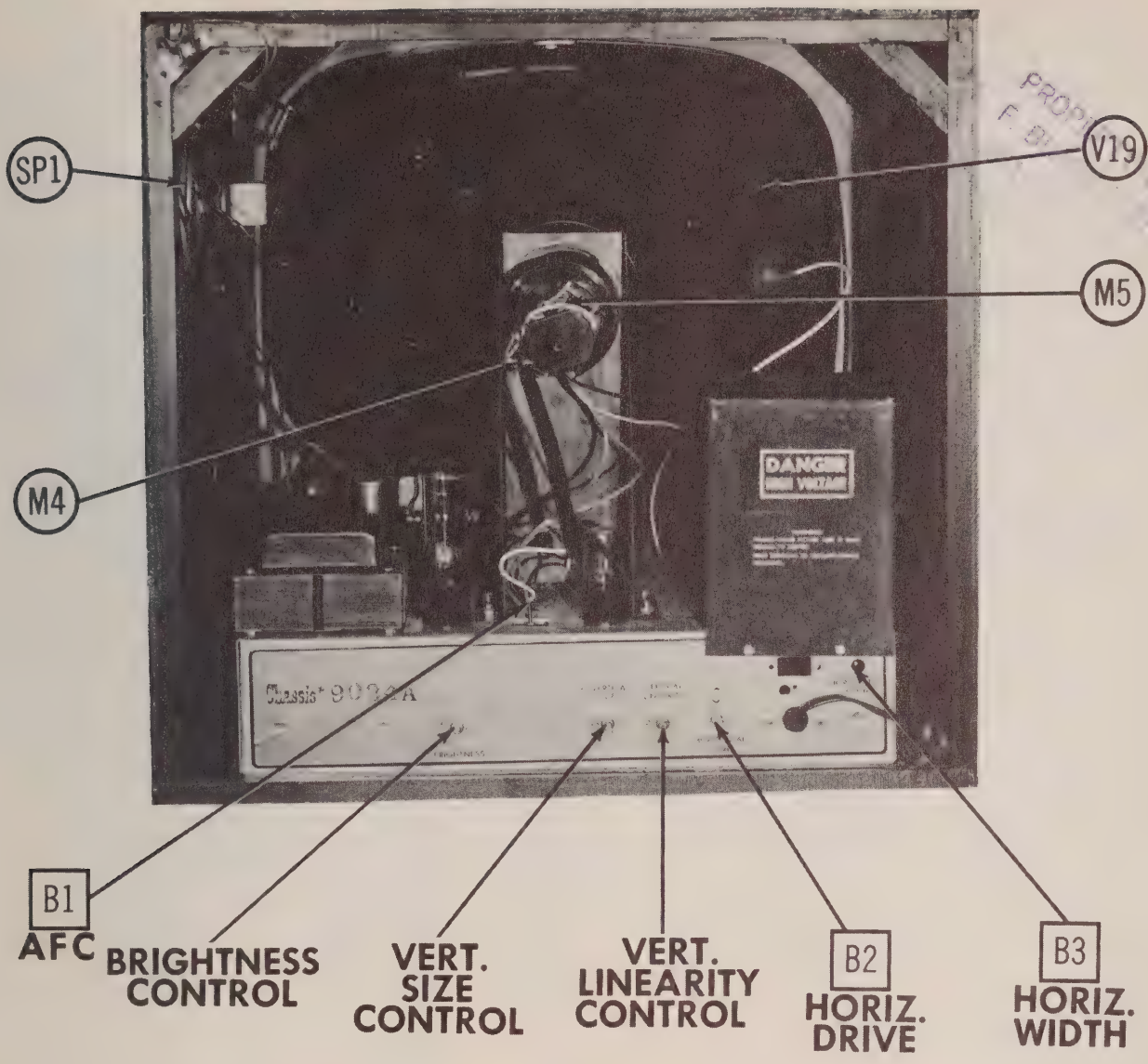
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at mid-position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression of the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See LOSS OF HIGH VOLTAGE.

Check amplitude of waveform at W13;

If Insufficient	If Sufficient
Substitute V14 and check circuit components. Check coupling capacitor between V14 and V15.	Substitute V15 and V16. Check T3, T4A, T5, C60 and other associated components.

DRIVE LINES

Check setting of drive control (B2). Substitute V15 and V16. Check associated components.

COMPRESSED LEFT SIDE

Substitute V15 and V16, Check T2 and associated components.

FOLDS

Substitute V16. Check T2, T4A and associated components.

XMAS TREE EFFECT

Substitute V14 and check C56.

VERTICAL

LOSS OF SWEEP

Check waveform W7;

If Unsatisfactory	If Satisfactory
Substitute V12 and check associated components.	Substitute V13. Check vertical output transformer and other components of the output tube.

INSUFFICIENT SWEEP

Follow procedure outlined under LOSS OF SWEEP.

COMPRESSED AT BOTTOM

Substitute V13 and check C3A and C3B.

FOLDS

Substitute V13. Check T3 and T4B. Check coupling capacitor between V12 and V13.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V9, V11 and V14. Check waveform W10;

If Unsatisfactory	If Satisfactory
Check waveform W3.	Check coupling network between V9B and V14A. Check circuit components of horizontal oscillator and discharge tube.

Check waveform W3;

If Unsatisfactory	If Satisfactory
Check coupling network between V6 and V11.	Check components of sync amplifier and sync clipper. Check coupling network between V11B and V9B.

CRITICAL HOLD

Follow procedure outlined under LOSS OF SYNC.

PULLING PICTURE (Fig. 1)

Check C66 and R78 for open.

VERTICAL

LOSS OF SYNC

Substitute V11 and V12. Check waveform W5;

If Unsatisfactory	If Satisfactory
Check components of sync amplifier and sync clipper. Check integrating network and coupling network between integrater and V12.	Check components of vertical oscillator and waveshaping network.

CRITICAL SYNC

Follow procedure outlined under LOSS OF SYNC.

TRIGGERING

Substitute V12 and dress filament leads away from any grid leads of vertical oscillator.

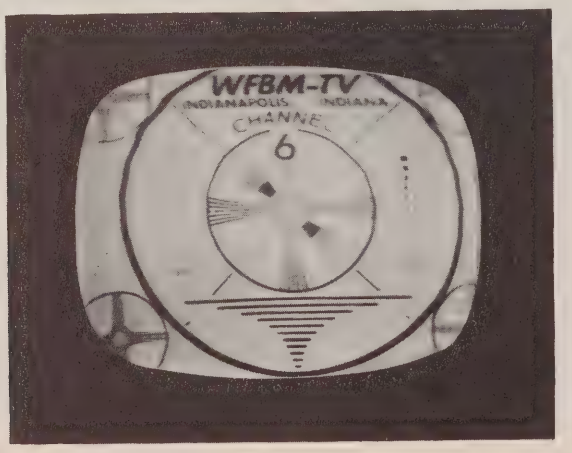
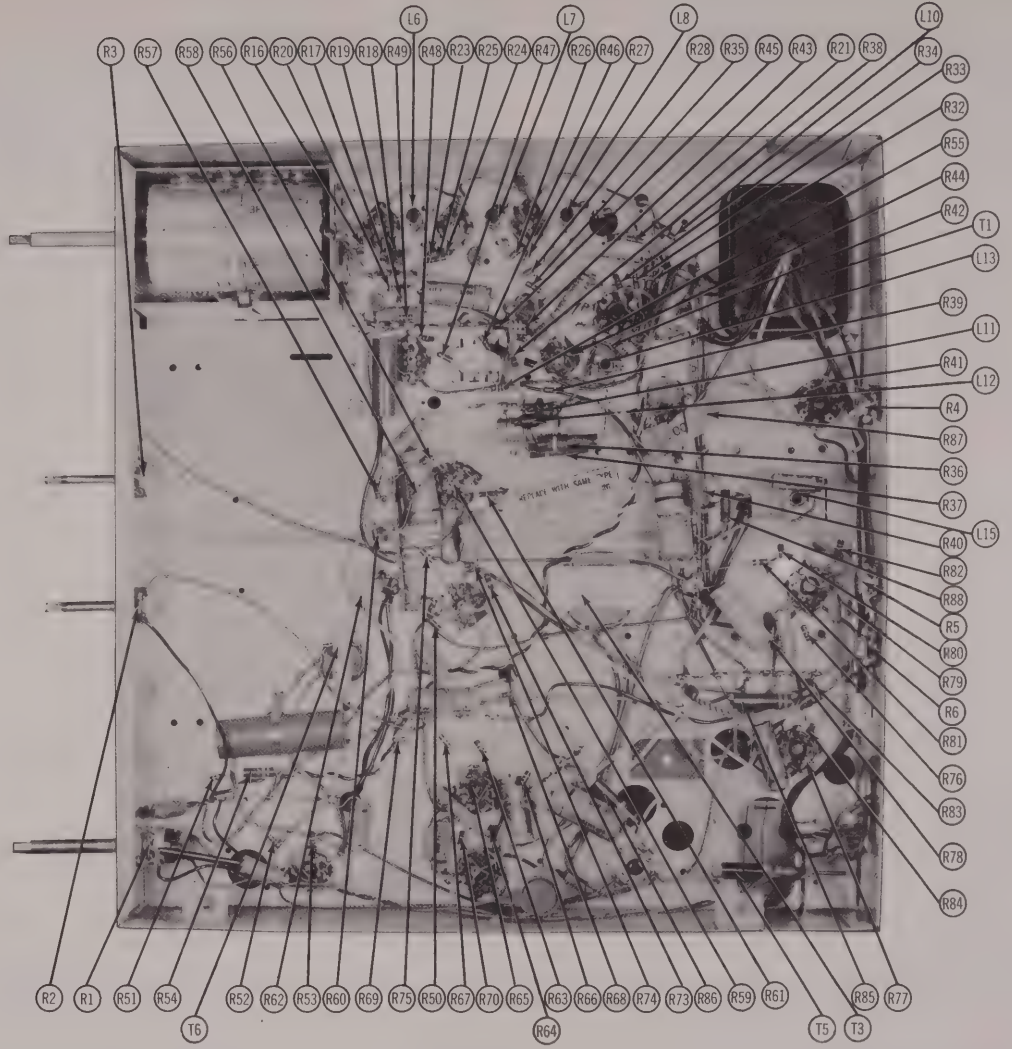


Fig. 1.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MIRRORTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6AG5	6AG5	7BD	
B	RF Amplifier	6BC5	6BC5	7BD	
C	RF Amplifier-	6CB6	6CB6	7CM	
V2A	Converter	6J6	6J6	7BF	
B	Converter	12AT7	12AT7	9A	Used in chassis 9034
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Output	6AC7	6AC7	8N	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AF Amplifier- Sync. Phase Det.	12AX7	12AX7	9A	
V10	Audio Output	6V6GT	6V6GT	7B	
V11	Sync. Separator- Sync. Amplifier	12AU7	12AU7	9A	
V12	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V13	Vert. Output	6SN7GTA	6SN7GTA	8BD	
V14	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6BQ6G	6BQ6G	5BT	
V16	Damper	6W4GT	6W4GT	6CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MIRRORTONE PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V19	20EP4A	20HP4A		13C	① Circuit changes necessary
		20HP4	①	13C	
		20LP4		13C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MIRRORTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	±40	450	CLC10075	AFH4-79		BO45		FP447	TVL-2764	
B	±40	450				BR2045A			TVA-1709	
C	±20	450								
C2A	±40	350	CLC10074A	AFH3-28		CO32		FP330,7	TVL-2617	
B	±10	350								
C3A	20	450	CLC10050	PR8450/20		BR2045A		TC75	TVA-1709	Red
B	100	25		PR825/100		BRH25A		TC2501	TVA-1207	Yellow
C4	50	350	CLA10087C	PR2450/50		BR5035		TC68	TVA-1613	
C5	4	50	CLA10027A	PR8150/4		BR550		TC50	TVA-1303	
C6	3-9				829-10					
C7	.5-3				829-3					
C8	120			SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C9	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C10	100			SI100	D6-101	TM5T1	GP1K-101	UC-5311	5GA-T1	
C11	.5-3				829-3			C7565A		
C12	20			SI20NP0	TCZ-20		NP0K-200	ZT-543	5TCC-Q2	
C13	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C14	.5-3				829-3			C7565A		
C15A	1000			BPD-3X001	DD-2-102	TM5DD1	S12-001	DCD-521	5HK-2D1	
B	5000									
C16	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C17	120			SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C18	5000			BPD-005	MD-502	TM5D5	S1L-005	DC-525	5HK-D5	
C19	5000			BPD-005	MD-502	TM5D5	S1L-005	DC-525	5HK-D5	
C20	5000			BPD-005	MD-502	TM5D5	S1L-005	DC-525	5HK-D5	Note 1
C21	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C22	5000			BPD-005	MD-502	TM5D5	S1L-005	DC-525	5HK-D5	
C23	10			SI10NP0	TCZ-10	5R5Q1	NP0K-100	ZT-541	5TCC-Q1	
C24	5000			BPD-005	MD-502	TM5D5	S1L-005	DC-525	5HK-D5	
C25	5000			BPD-005	MD-502	TM5D5	S1L-005	DC-525	5HK-D5	
C26	5000			BPD-005	MD-502	TM5D5	S1L-005	DC-525	5HK-D5	
C27	5									
C28	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C29	S80			S2680	D6-681		GP2K-681	UC-5368	5GA-T68	
C30	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C31	5									
C32	39	500		1468-00004	TCZ-39	5R5Q4	NP0L-390	MCB223	MS-44	
C33	39	500		1468-00004	TCZ-39	5R5Q4	NP0L-390	MCB223	MS-44	
C34	.02	600		P688-02	DD-203	PTE6S2		PT612	6TM-S2	
C35	5000			BPD-005	MD-502	TM5D5	S1L-005	DC-525	5HK-D5	
C36	.02	600		P688-02	DD-203	PTE6S2		PT612	6TM-S2	
C37	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C38	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	Note 5
C39	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C40	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C41	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C42	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C43	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C44	S20		CC-15231	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C45	.25	600		684-25		PTE6P25		PT6025	6TM-P25	Note 2
C46A	.002			P688-002		PTE6D2		PT622		
B	.005		◆CMX-10012	P688-005	◆PC-100	PTE6D5	◆1405-01	PT625	◆101C1	
C	.005			P688-005		PTE6D5		PT625		
C47	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C48	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	Note 6
C49	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C50	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C51	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C52	270	500	CM-1527TA		TCZ-270					Note 7
C53	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C54	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	Note 3

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MIRRORTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTE
C55	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	Note 2
C56	.004	400		1464-004		1DR5D4				
C57	270	500	CM-1527TA		TCZ-270					
C58	430	500	CM-1543TA							
C59	270	500	CM-1527TA		TCZ-270					
C60	.05	600		P688-05	DF-503	PTE6S1		PT615	6TM-S5	
C61	.25	600		684-25		PTE6P25		PT6025	6TM-P25	
C62	.25	600		684-25		PTE6P25		PT6025	6TM-P25	
C63	56	2000								
C64	5000			BPD-005	MD-502	TM5D5	GP2-333-502	DC-525	5HK-D5	
C65	5000			BPD-005	MD-502	TM5D5	GP2-333-502	DC-525	5HK-D5	
C66	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	Note 1
C67	5000			BPD-005	MD-502	TM5D5	GP2-333-502	DC-525	5HK-D5	Note 4
C68	5000			BPD-005	MD-502	TM5D5	GP2-333-502	DC-525	5HK-D5	Note 4

Note 1. Used in Ch. 9034A only.
Note 2. Some Models use .05MFD in this application.
Note 3. Some Models use .005MFD in this application.
Note 4. Not used in Ch. 9034 & 9034A.
◆ Units C46A, C46B, C46C, R62A, R62B, And R62C are combined in one unit.
Note 5. Some Models use .0035MFD in this application.
Note 6. Not used in all Models.
Note 7. Some Models use 430MMF in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MIRRORTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750Ω		VC-13127	QJ-246*	RTV-297	SBBT-S2-S	WP13-T2S1	Constrast-Tap② 500Ω-Panel
B	250KΩ						UR254A	Volume-Rear
C	Switch						UB-26	Attach to R1B
R2A	1.3Meg		VC-13132E	QU-138	AG-83-8	AB-69	U-56	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A
R3A	50KΩ		VC-13131E	QU-123	AG-44-8	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A
R4A	100KΩ		VCA-13135A	QU-128	AG-49-8	AB-60	U-41	Brightness
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R4A
R5A	2.5Meg		VC-13121D	QU-239	AG-84-8	AB-83	SU-565	Vert. Size
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R5A
R6A	5000Ω		VC-13120C	QU-114	AG-19-8	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R6A

* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B17-105X & P1-210 (Panel) B13-130 & R2-226 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MIRRORTONE PART No.	IRC PART No.	NOTES
R7	3900Ω			BTS-3900	
R8	47KΩ				
R9	10KΩ			BTS-10K	
R10	2200Ω			BTS-2200	
R11	4700Ω			BTS-4700	
R12	2200KΩ			BTS-2203K	
R13	15KΩ				
R14	10KΩ			BTS-10K	
R15	4700Ω			BTS-4700	
R16	22KΩ				
R17	6ΩΩ			BTS-82	
R18	100Ω			BTS-100	
R19	470Ω			BTS-470	
R20	470Ω			BTS-470	
R21	1 Meg			BTS-1 Meg	
R22	470Ω			BTS-470	Note 1
R23	18KΩ				Note 2
R24	82Ω			BTS-82	
R25	100Ω			BTS-100	
R26	3300Ω			BTS-3300	Note 3
R27	82Ω			BTS-82	
R28	100Ω			BTS-100	
R29	6800Ω			BTS-6800	Note 1
R30	180Ω			BTS-180	Note 1
R31	100 Ω			BTS-100	Note 1
R32	8200Ω			BTS-8200	
R33	1 Meg			BTS-1 Meg	
R34	110Ω-5%			BTS-110-5%	
R35	1000Ω			BTS-1000	
R36	22KΩ	2		BTS-22K	Note 5
R37	22KΩ	2		BTS-22K	Note 5
R38	10KΩ			BTS-10K	
R39	220KΩ			BTS-220K	Note 6
R40	8200Ω			BTS-8200	Note 9
R41	220KΩ			BTS-220K	
R42	47KΩ				
R43	1000Ω			BTS-1000	
R44	12KΩ			BTS-12K	
R45	33KΩ	1		BTA-33K	Note 7
R46	1000Ω			BTS-1000	
R47	15KΩ			BTS-15K	
R48	6800Ω			BTS-6800	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MIRRORTONE PART No.	IRC PART No.	NOTES
R49	6800 Ω			BTS-6800	
R50	10Meg			BTS-10Meg	
R51	470KΩ			BTS-470K	
R52	330KΩ-5%			BTS-330K-5%	
R53	180KΩ-5%			BTS-180K-5%	
R54	33ΩΩ			BTA-33Ω	Note 8
R55	18ΩΩ			BTS-18K	
R56	470KΩ			BTS-470K	
R57	2.2Meg			BTS-2.2Meg	
R58	4700Ω			BTS-4700	
R59	47KΩ			BTS-47K	
R60	100KΩ			BTS-100K	
R61	15KΩ			BTS-15K	
R62A	22KΩ			BTS-22K	
B	8200Ω		◆CMX-1012	BTS-8200	
C	8200Ω			BTS-8200	
R63	330KΩ			BTS-330K	
R64	33KΩ			BTS-33K	
R65	1000Ω			BTS-1000	
R66	470KΩ			BTS-470K	
R67	680KΩ			BTS-680K	
R68	620KΩ			BTS-820K	
R69	4700Ω			BTS-4700	
R70	2.2Meg			BTS-2.2Meg	
R71	56ΩΩ			BTS-56Ω	
R72	56ΩΩ			BTS-56Ω	
R73	100KΩ			BTS-100K	
R74	47KΩ			BTS-47K	
R75	680KΩ			BTS-680K	
R76	470KΩ			BTS-470K	
R77	47KΩ			BTS-47K	
R78	47KΩ			BTS-47K	Note 9
R79	1500Ω			BTS-1500	
R80	5800Ω			BTS-5800	
R81	100KΩ			BTS-100K	
R82	220KΩ			BTS-220K	
R83	1 Meg			BTS-1 Meg	
R84	68Ω				
R85	6800Ω	2		BTB-6800	
R86	8200Ω	2		BTB-8200	
R87	200Ω	10		1 3/4A-200	
R88	1500Ω	1		BTA-1500	

Note 1. Used only in chassis No. 9033.
Note 2. Chassis No. 9033 uses a 8200Ω resistor in this application.
Note 3. Chassis No. 9033 uses a 10KΩ resistor in this application.
Note 4. Chassis No. 9033 uses a 180Ω resistor in this application.
Note 5. Some models use a 11KΩ resistor (4 Watt) in this application.
Note 6. Some models use a 270KΩ resistor in this application.
Note 7. Some models use a 39KΩ resistor in this application.
Note 8. Some models use a 39Ω resistor in this application.
Note 9. Not used in all models.
◆ Items R62A, R62B, R62C, C46A, C46B, C46C are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MIRRORTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No.	REPLACEMENT DATA: RCA TYPE No.
T1	117VAC ② 1.68A	730VCT .175ADC	5VAC ③ 3A	6.3VAC ④ 1.2A SEC 4 6.3 VAC ⑤ 8.3A	TPC-10011	P-8163①	P-3078	TP-380①	R-37BC	20U70

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MIRRORTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	450Ω Tap ② 50Ω	12Ω Tap ③ 6Ω, 8.2Ω SEC. 2 5Ω SEC. 3 6Ω	TH-10003	A-8130④⑫	HVO-10③	TFB-8	D-14 ④		Horiz. Output Trans.
T3	1000Ω Tap ② 12Ω		TOB-10045E	A-8123	A-3037	TBO-8	A-102X	222D1	Vert. Output Trans.
T4A	16Ω		YDB-10001A	DY-9A	MDF-70	TY-5	Y-21	206D1	Horiz. Deflection Coils.
B	6Ω								Vert. Deflection Coils.
T5	4Ω		TO-10023		MWC-2⑤	TW-1		201R1	Width Coil

① Use with width coil WC-5.
② See instruction sheet packed with unit (Schematic 1 & 5A) for terminal connections.
③ Mount on side of Hi-Voltage cage.
④ Use with width coil WC-11.
⑤ Enlarge mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MIRRORTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	4.25KΩ	3.3Ω	250Ω	.47Ω	TOC-10034	A-3877 ①	A-2930 ①	RO-9 ①	S-5X ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: MIRRORTONE PART No.	JENSEN PART No.	QUAM PART No.	HORNS
SP1	5"	PM	3.3Ω	SCR-10026	ST-105 Mod. P5- X	5A07	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MIRRORTONE PART No.	MILLER PART No.	MEISSNER PART No.	NOTES
L1	Ant. Coils	0Ω CT	0Ω				
L2	Fil. Choke	0Ω					
L3	RF, Mixer Grid & Osc. Coils	0Ω					
L4	Fil. Choke	0Ω					
L5	1st. Video IF	1Ω					
L6	2nd. Video IF	.2Ω	.2Ω			17-1062	
L7	3rd. Video IF	.3Ω	.3Ω			17-1063	
L8	4th. Video IF						
L9	5th. Video IF	.2Ω	.2Ω			17-1064	Not used in all Models
L10	Series Peaking Coil	7.5Ω			4642	19-3125	120 Microhenries
L11	Shunt Peaking Coil	12.5Ω				19-3300	300 Microhenries
L12	4.5MC Trap	1Ω			1470 *	20-1004 †	
L13	Sound IF	2Ω			1470	17-3401	
L14	Ratio Det.	1Ω	.3Ω CT	TSB-10061	1468	17-1053	Tertiary Winding - .25Ω
L15	Horiz. Osc.	60Ω			6210	19-1576	

* Tunable, drill mounting hole, add 39 MMF capacitor in parallel.
† Drill mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: MIRRORTONE PART No. FUSE	MIRRORTONE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG P/T	1/4A. 250V.	FA-10001		318.250 (3AG 1/4A P/T)		GJV-1/4	

MISCELLANEOUS

ITEM No.	PART NAME	REPLACEMENT DATA: MIRRORTONE PART No.	NOTES
M2A	RF Tuner	TT-10012	Standard Coil for Ch. 9034A
B	RF Tuner	ZKC-10655	Alternate (Barker Tarzian)
M3	Crystal Diode	GD-10001	
M4	Centering Magnet	MDA-10001	
M5	Ion Trap	ITA-10002A	
B2	Trimmer Capacitor	CT10005	Horiz. Drive (25-280MMF)

MIRRORTONE MODELS 17PCSB, PCW, PTE, 20PCSB, PCW, PTE, PTS, PTSB, PTW, TPRSB, 21PCS, QDCS, 24QDCS

TROUBLE SHOOTING AIDS (CONT.)

VIDEO

SOUND BARS

Check by substitution L12 (4-1/2 MC trap, self resonant). Check setting of local oscillator and alignment of video IF stages.

POOR RESOLUTION

Check alignment of tuner and IF stages. Substitute V6 and check associated components.

SMEAR

Substitute V6 and check circuit components.

ONE WIDE BLACK BAR ACROSS PICTURE

Check tuner, video IF and video amplifier tubes for filament to cathode leakage. Check tube sockets for same thing.

POOR CONTRAST

Check waveform W1;

If Unsatisfactory	If Satisfactory
Check alignment of video IF and tuner. Check associated components.	Check waveform W2.

Check waveform W2

If Unsatisfactory	If Satisfactory
Substitute V6 and check associated components.	Check picture tube grid components. Check picture tube.

AUDIO

WEAK OR NO SOUND

Substitute V7, V8, V9 and V10. Check alignment of sound and video IF.

BUZZ

Adjust ratio detector secondary for minimum buzz. Substitute V8. Check local oscillator setting. Check for overload at waveform W1. If overload exists, check AGC network.

DISTORTED

Check audio stages using audio signal generator and scope

If Undistorted	If Distorted
Check alignment of sound IF and ratio detector.	Substitute V9 and V10. Check circuit components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check waveform W13.

If Unsatisfactory	If Satisfactory
Substitute V14 and check circuit components particularly L15.	Substitute V15, V16 and V17. Check T2, T4A, T5 and associated components.

WEAK HIGH VOLTAGE

If substitution of V14, V15, V16 and V17 does not correct trouble, follow procedure outlined under LOSS OF HIGH VOLTAGE.

BLOOMING

If substitution of V14, V15, V16, V17 and V18 does not correct trouble, follow procedure outlined under LOSS OF HIGH VOLTAGE.

POWER

SMALL RASTER

Substitute V18 and check filter components. Check B plus circuit for shorts.

DIM PICTURE

Substitute V18 and check B plus components.

GENERAL

NO PICTURE, NO SOUND, NO SNOW

Substitute V2 and V6. Check associated components.

WEAK PICTURE AND WEAK SOUND

Substitute V3, V4 and V5. Check video IF alignment.

SOUND WITH WEAK PICTURE

Substitute V1 and check tuner alignment and components.

RECEIVER INOPERATIVE

Substitute V18. Check 1/4 amp. fuse solder under chassis. Check B plus components.

The Trouble - Shooting photographs shown above are made with permission of transmitting station WFBM-TV and in no way reflect the quality of the transmitted picture. Similarly, symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

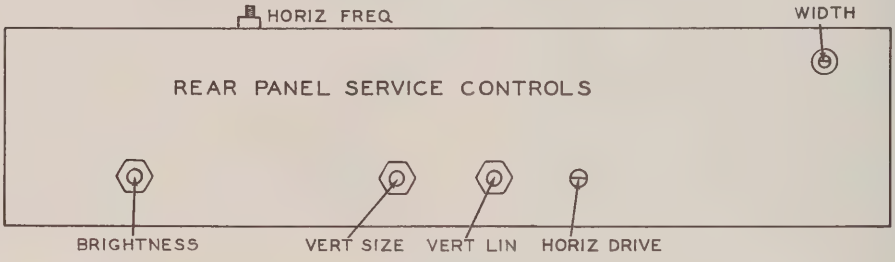
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove three wood screws holding wood strip at top of the cabinet. Remove wood strip and safety glass by tilting at top and out. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horiz. hold control at the center of its range and adjust the horiz. frequency slug (L15) until picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF detector buzz, adjust the ratio detector secondary (L14) located on bottom of chassis. (See tube placement chart).

FUSES

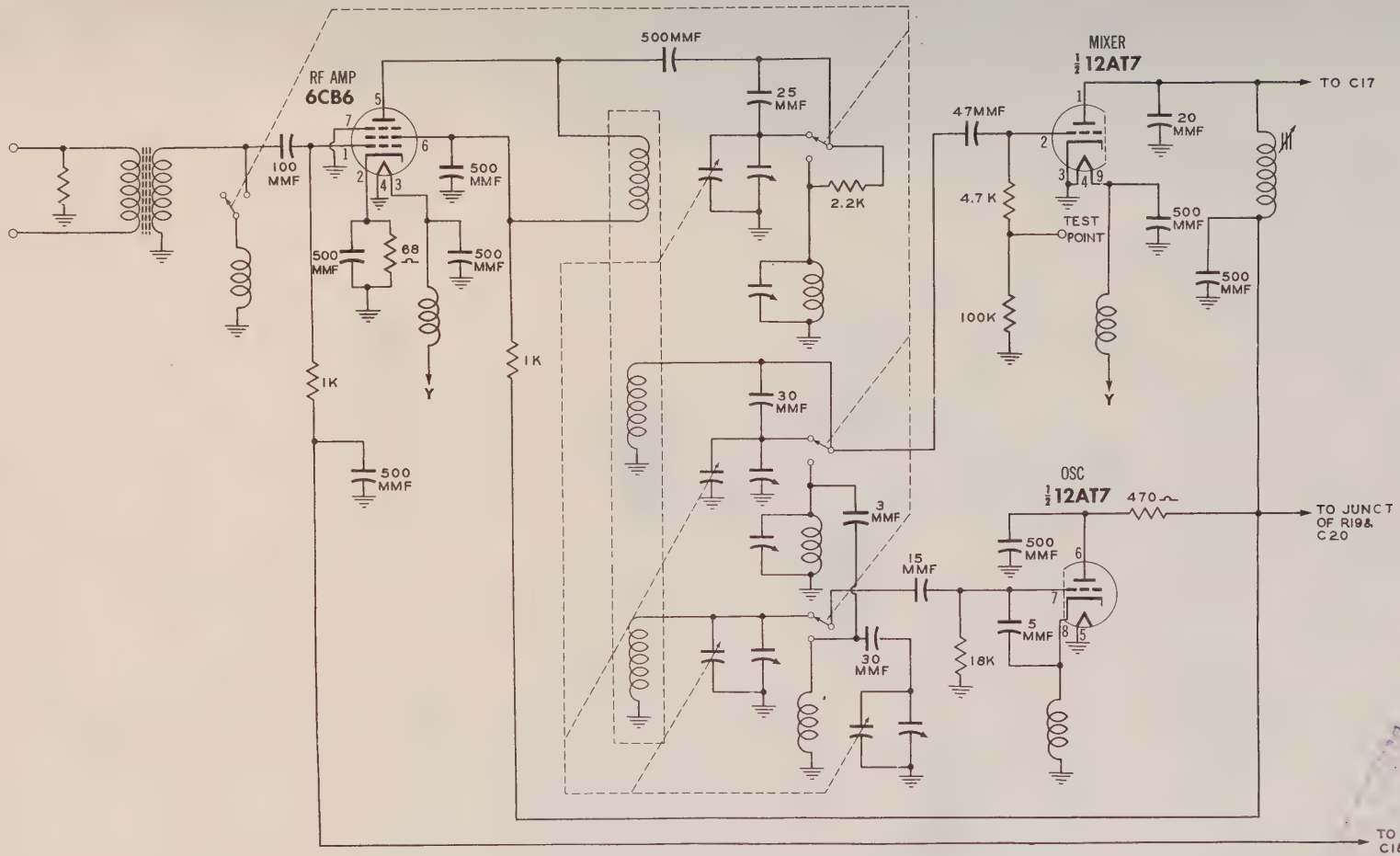
One fuse is used for LV Power Supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of picture tube located flush against the yoke. Turn the disc -like knob and at the same time rotate the ring around the tube until picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push on type control knobs from front panel.
2. Remove 5 wood screws. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove 2 wood screws. Remove antenna bracket.
5. Remove 1 wood screw. Remove CRT brace.
6. Remove 4 chassis bolts. Remove chassis.
7. Remove 2 speaker nuts. Remove speaker (Not necessary for chassis removal).



SELECTOR SWITCH SHOWN IN LOW BAND POSITION

ALTERNATE TUNER PART NUMBER XX D-107105

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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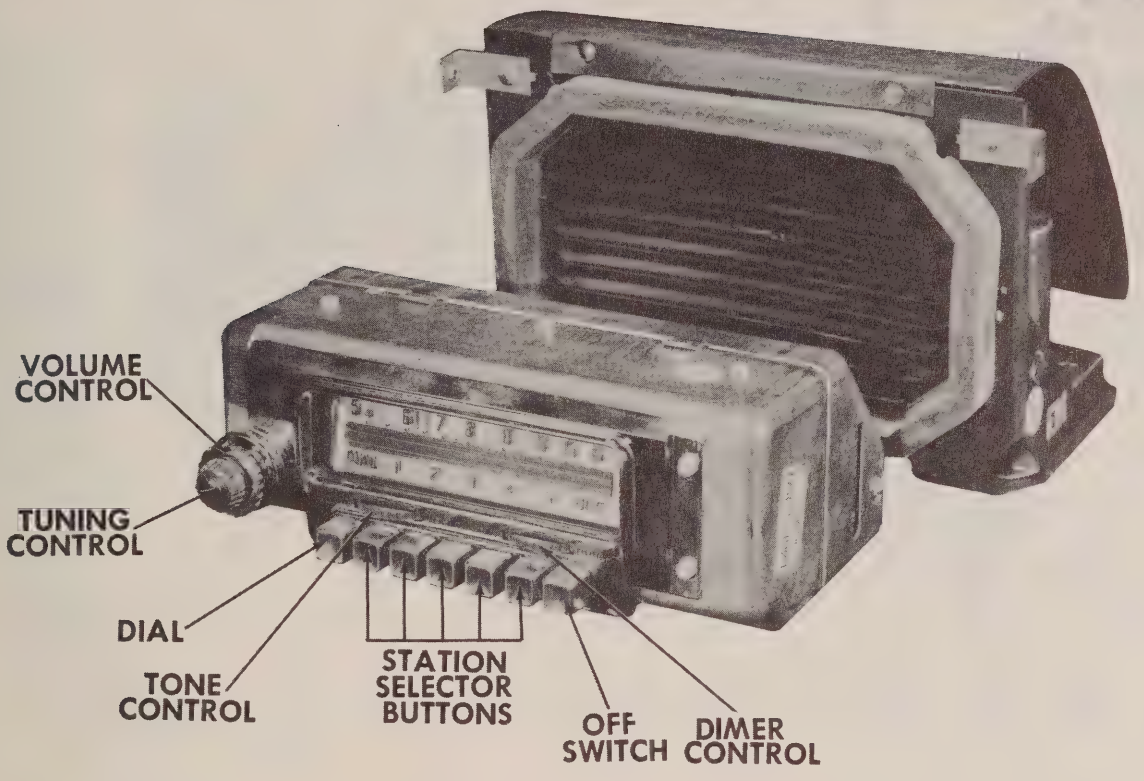
PROPERTY OF

ALTERNATE TUNER SCHEMATIC

PROPERTY OF

MOPAR
MODEL 821



MOPAR
MODEL 821

TRADE NAME	Mopar Model 821 (For S-16 & S-18 Desoto Automobiles)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated AM Superheterodyne Custom Built Automobile Receiver
TUBES (Eight)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AT6 Phase Inv., (2) 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 8 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

PUSH BUTTON ADJUSTMENT

The push button antenna trimmer, A12, should be adjusted before setting push buttons.

PUSH BUTTON RANGE

#1 (Second button from left)	535-1020KC
#2	610-1200KC
#3	700-1410KC
#4	740-1480KC
#5	840-1600KC

Push in DIAL button and allow receiver to warm up for least 15 minutes.
Antenna should be fully extended.
Turn tone control to voice position.
Remove metal caps from push button to gain across to the knurled adjustment knobs.
Turn manually to station selected for the button being adjusted.
Push the button in and turn adjustment knob to tune desired station. Check setting by pushing DIAL button again.
Repeat procedure for remaining push buttons.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplfier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det-AVC-AF Amp.	6AT6	6AT6	7BT	
V5	Phase Inverter	6AT6	6AT6	7BT	
V6	Audio Output	6AQ5	6AQ5	7BZ	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■30	350	23A473015	AFH3-169		C131		FP331	TVL-3620	
B	▲30	300								
C	20	25								
C2	50		21K74661							
C3	.006	100	8C4529	P488-006		PTE6D6	GP2-333-602	PT626	6TM-D6	
C4	10		21K580178	SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C5	.05	100	8R13515	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C6	115		21K502851							
C7	5		21K70720	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C8	47		21R115890	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C9	.1	400	8R13166	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C10	.05	400	8R14791	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C11	5		21K70720	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCC B-V47	
C12	100		21R410036	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C13	.02	100	8R51209	P288-02	DF-203	PJ2S5		PT412	2TM-S2	
C14	.05	100	8R13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C15	.01	100	8R474754	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C16	.01	400	8R23690	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C17	500		21R6673	SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C18	.03	600	8R71911	P688-03		PTE6S3		PT613	6TM-S3	
C19	.03	600	8R71911	P688-03		PTE6S3		PT613	6TM-S3	
C20	.003	400	8R490437	P488-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C21	.25	100	8R4283	P488-25		PTE4P25		PT4025	2TM-P25	
C22	.02	1000	8K114137	P1088-02		PTE16S2		PT1612	MB-S2	
C23	.5	100	8C580845	P185-5		MP2P5			68P20	
C24	.5	100	8C580845	P185-5		MP2P5			68P20	

CONTROLS

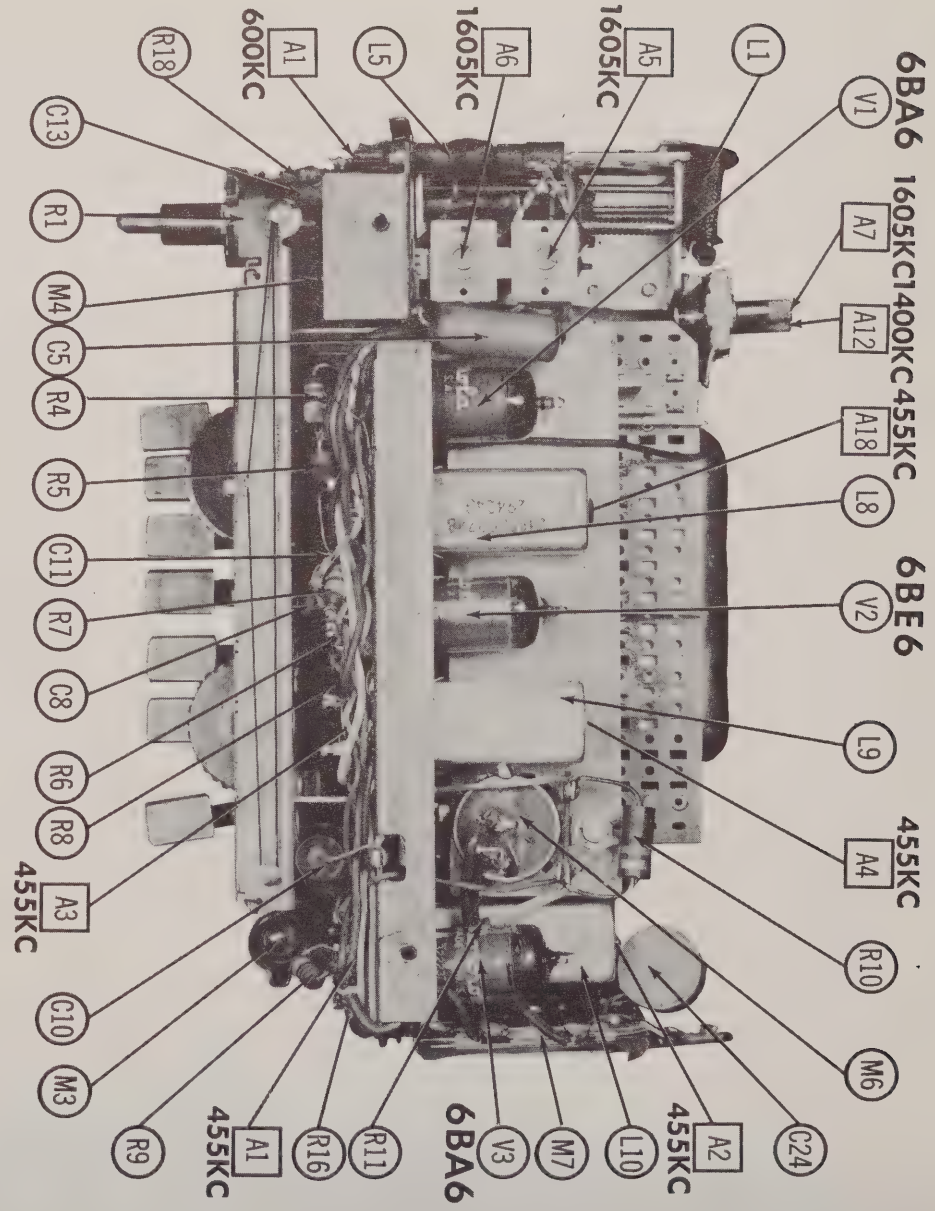
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500KΩ	½	18A501857B					Volume & Sw.-tapped @ 50KΩ
R2	500KΩ	½	18A501754					Tone
R29	30Ω	½	17A502225					Dimmer-Wire Wound

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R3	*70KΩ	½	6R6032	BTS-470K	
R4	180Ω	½	6R5660	BTS-180	
R5	150KΩ	½	6R6182	BTS-150K	
R6	100KΩ	½	6R6075	BTS-100K	
R7	47KΩ	½	6R6056	BTS-47K	
R8	12KΩ	1	6R5656	BTA-12K	
R9	390Ω	1	6R5554	BTS-390	
R10	15KΩ	2	6R5732	BTB-15K	
R11	330Ω	½	6R6010	BTS-330	
R12	68KΩ	½	6R6001	BTS-68K	
R13	47KΩ	½	6R6056	BTS-47K	
R14	10KΩ	½	6R6054	BTS-10K	
R15	1Meg	½	6R6004	BTS-1Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R16	1Meg	½	6R6004	BTS-1Meg	
R17	1500Ω	½	6R6161	BTS-1500	
R18	4.7Meg	½	6R2122	BTS-4.7Meg	
R19	220KΩ	½	6R6015	BTS-220K	
R20	2200Ω	½	6R6069	BTS-2200	
R21	10KΩ	½	6R6320	BTS-10K	
R22	220KΩ	½	6R6015	BTS-220K	
R23	220KΩ	½	6R6407	BTS-220K	
R24	270Ω	1	6R6336	BTA-270	
R25	220KΩ	½	6R6015	BTS-220K	
R26	2200Ω	2	6R476130	BTB-2200	
R27	56Ω	½	6R5614		
R28	56Ω	½	6R5614		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC @ 3.6A	450VCT .050ADC			25C501644		P-3068 ①	VT-2	

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	8.8KΩ	3.6Ω	590Ω	.5Ω	25B501722	A-3850 ①	A-2900①	RO-301①	S-51X ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 x 9"	6 Volt	3.6Ω	50C511102 50C510428 ① 50K511450 ① 50C502337 ② 50C501778 ② 50C502190 ②	ST-814 Mod. F69-T	69EV6	① Alternate 6 x 9" EM Speakers ② 6 x 9" PM Speakers Tape lead used for EM speaker field when using PM speaker.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	MOTOROLA PART No.	MILLER PART No.	MEISSNER PART No.	
L1	Ant. RF Choke	0Ω		24B580540			
L2	Ant. Coil	12Ω		24A510162			Less core, Core part #46A510160 (With screw), Manual tuning
L3	RF Coil	12Ω		24A510164			Less core, Core part #46A510160 (With Screw), Manual tuning
L4	Osc. Coil	2.8Ω		24K510163			Less core, Core part #46A510160 (With screw), Manual tuning
L5	Osc.Shunt Coil	5.8Ω		24K501921			Manual tuning and pushbutton tuning tapped @ 1Ω
L6	Ant. Coil Assy.			51K513376			Pushbutton tuning, Includes coils, push button switch, C4, C6, 395-470MMF Variable mica capacitor and 20-120MMF Variable mica capacitor
L7	Osc.Coil Assy.						Part of L6
L8	455KC IF Trap	85Ω		24B580274			Tapped @ 26Ω
L9	Input IF	17Ω	16Ω	24B485553 †	12-C1	16-6758	† Alternate part #24K502819
L10	Output IF	16Ω	17Ω	24K485555	12-C6	16-6770	
L11	Hash Choke	0Ω		24A472535	5221		15.2 Microhenries

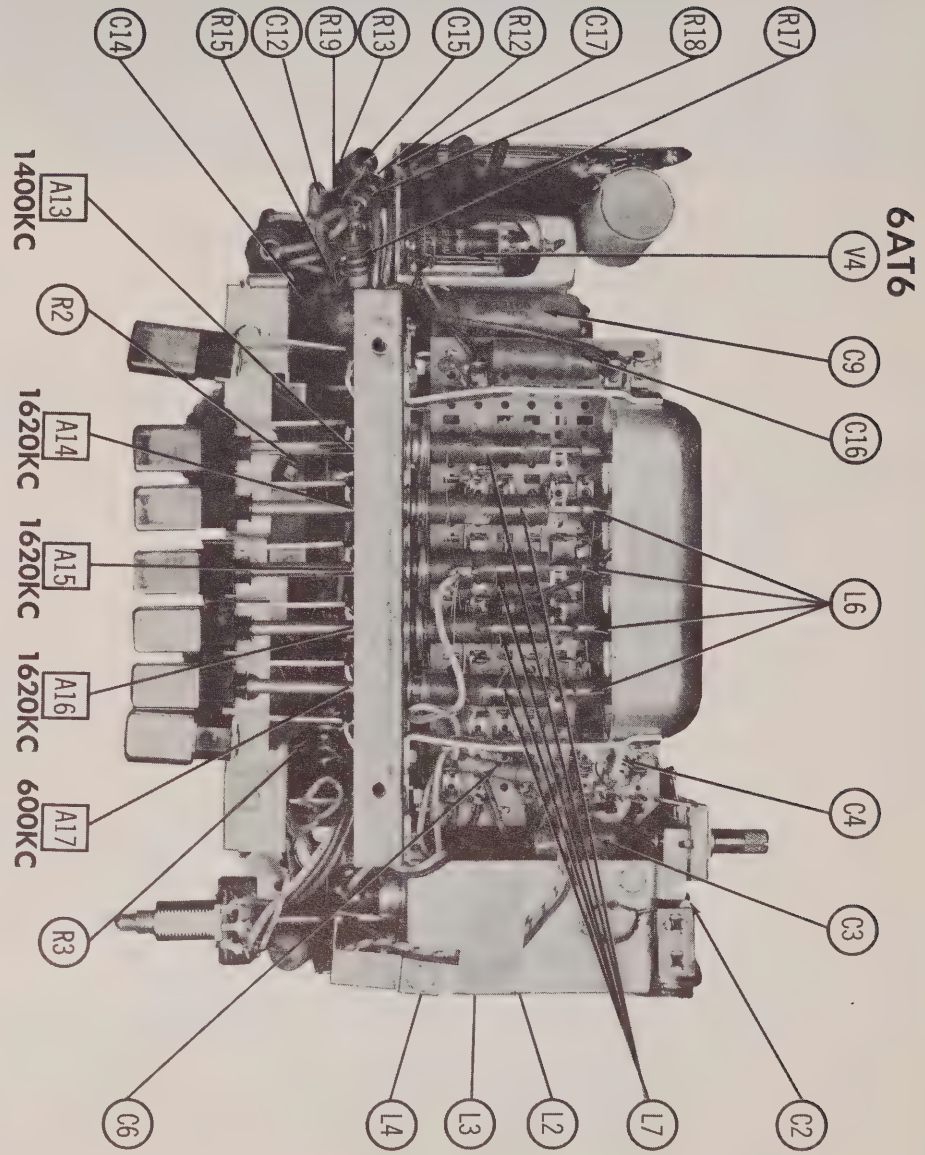
VIBRATOR

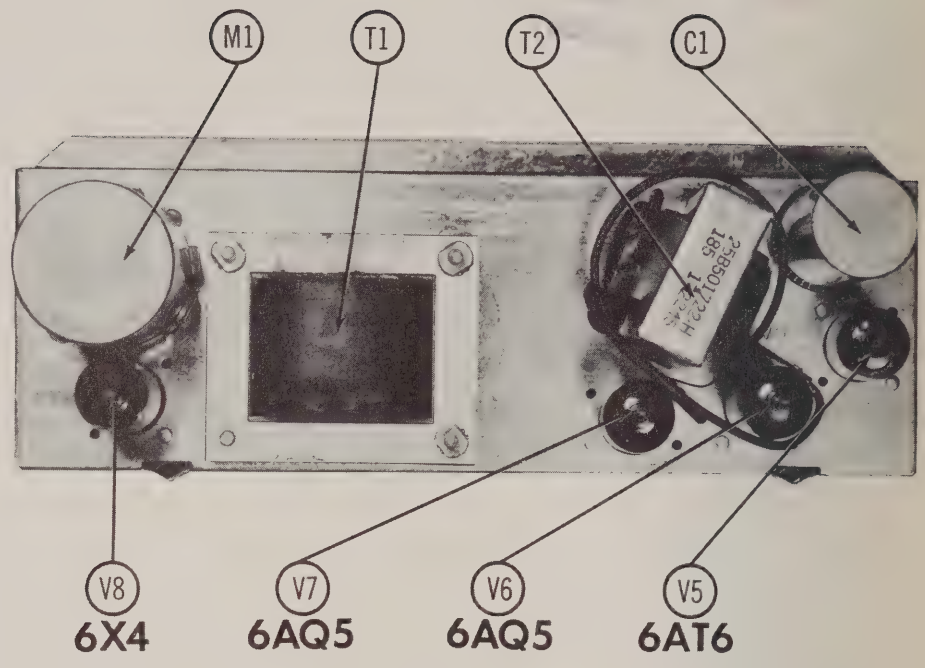
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Int.	6.3V	115∿	48B3333	5342	859	5342	

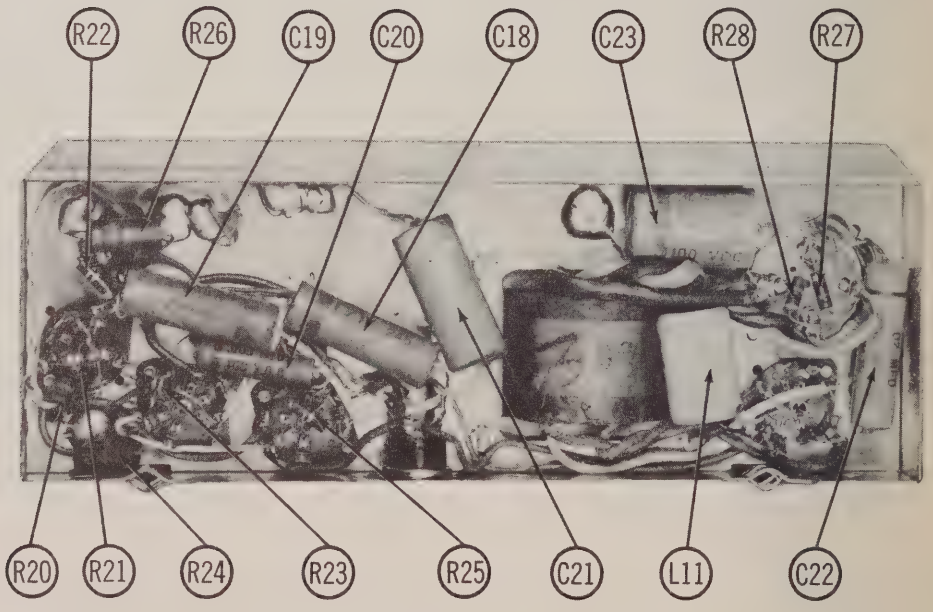
FUSES

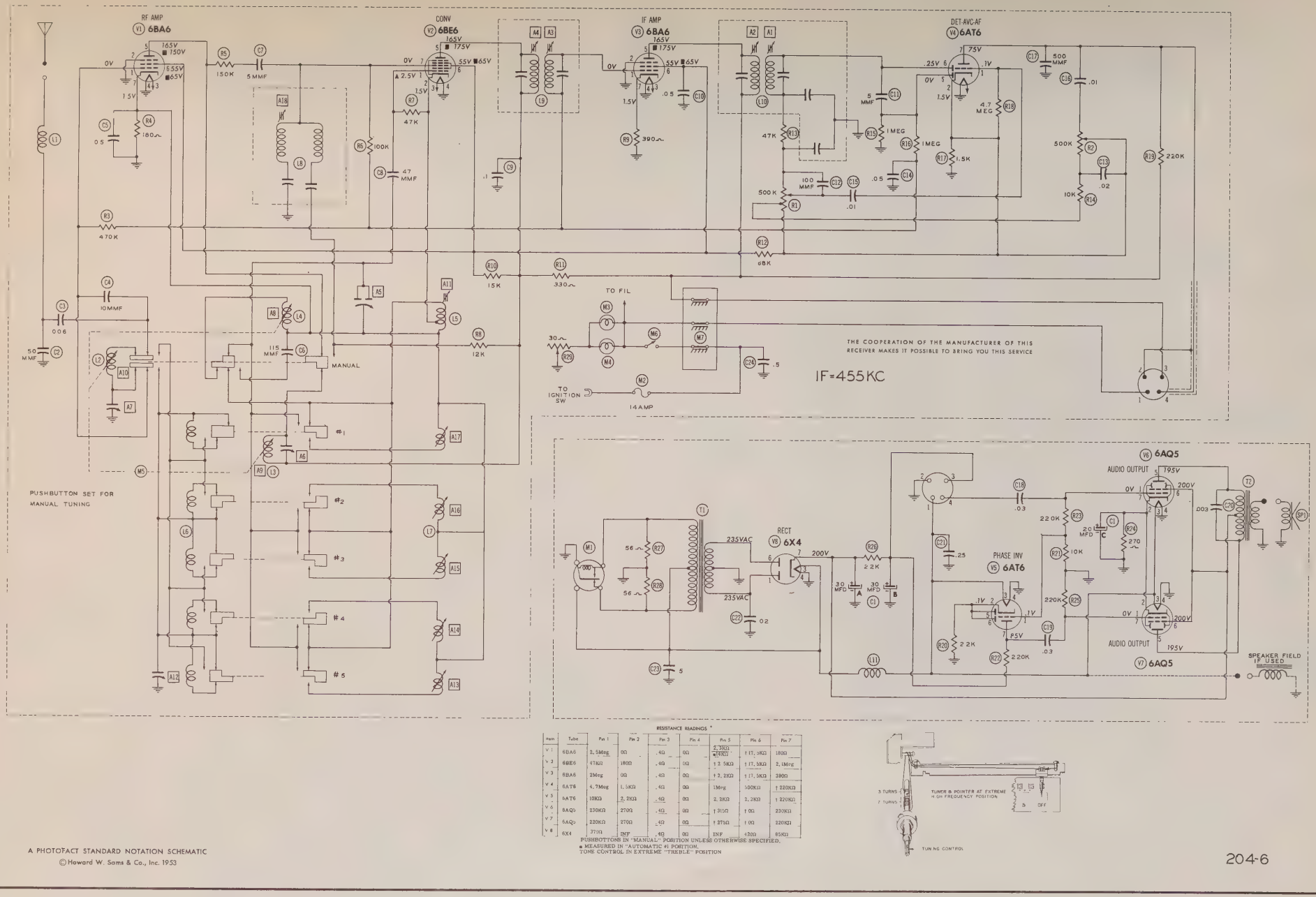
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A 32V	65K12894	9K521119 or 9K502241	307014 (SFE-14A)	155014	SFE-14	HDI

CHASSIS—BOTTOM VIEW




M1
T1
T2
C1
V8
6X4
V7
6AQ5
V6
6AQ5
V5
6AT6


R22
R26
C19
C20
C18
C23
R28
R27
R20
R21
R24
R23
R25
C21
L11
C22



RESISTANCE READINGS *

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	2, 5Meg	0Ω	.4Ω	0Ω	2.3MΩ ▲14KΩ	↑17.5KΩ	180Ω
V 2	6BE6	47KΩ	180Ω	.4Ω	0Ω	↑2.5KΩ	↑17.5KΩ	2, 1Meg
V 3	6BA6	2Meg	0Ω	.4Ω	0Ω	↑2, 2KΩ	↑17.5KΩ	390Ω
V 4	6AT6	4, 7Meg	1, 5KΩ	.4Ω	0Ω	1Meg	500KΩ	↑220KΩ
V 5	6AT6	10KΩ	2, 2KΩ	.4Ω	0Ω	2, 2KΩ	2, 2KΩ	↑220KΩ
V 6	6AQ5	230KΩ	270Ω	.4Ω	0Ω	↑315Ω	↑0Ω	230KΩ
V 7	6AQ5	220KΩ	270Ω	.4Ω	0Ω	↑275Ω	↑0Ω	220KΩ
V 8	6X4	370Ω	INF	.4Ω	0Ω	INF	420Ω	85KΩ

PUSHBUTTONS IN "MANUAL" POSITION UNLESS OTHERWISE SPECIFIED.
* MEASURED IN "AUTOMATIC #1 POSITION.
TONE CONTROL IN EXTREME "TREBLE" POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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204-6

1 - DC Voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

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MODEL 2118

PACKARD-BELL
MODEL 2118

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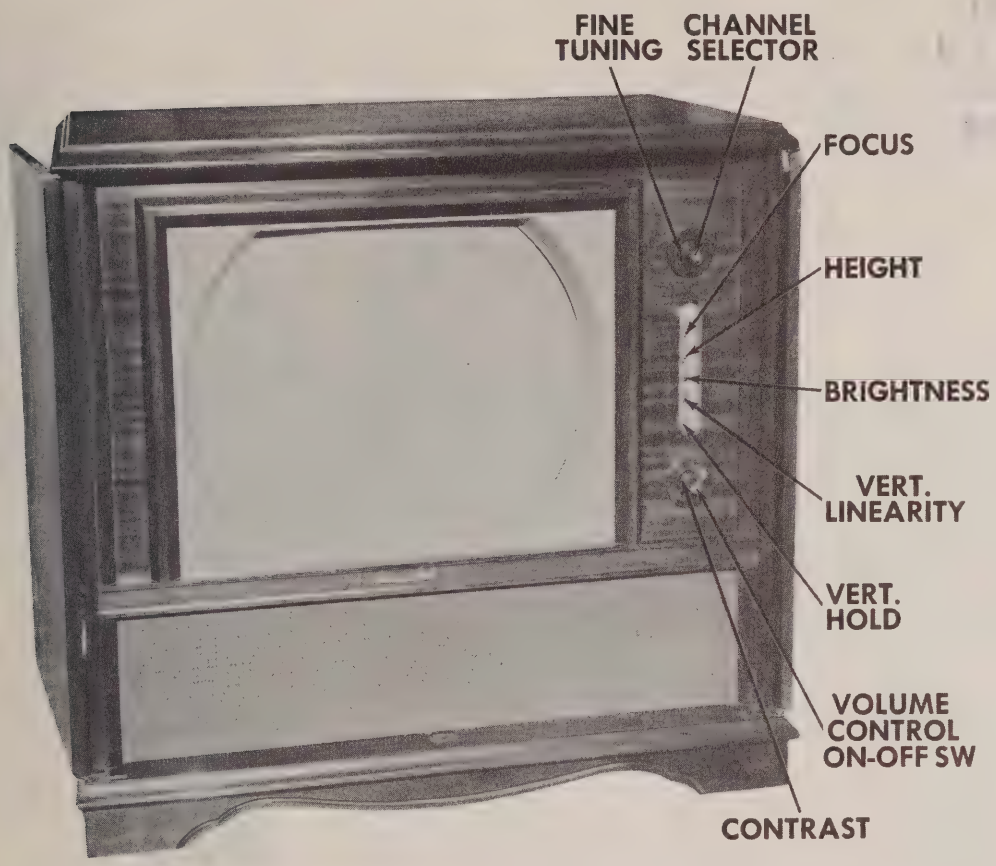
DATE 5-53 SET 204 FOLDER 7



PACKARD-BELL
MODEL 2118

TRADE NAME	Packard-Bell Model 2118
MANUFACTURER	Packard-Bell Co. -Service Div., 11th. & Hope Sts., Los Angeles 15, Calif.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.56 Amp @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13, Video IF 25MC, Sound IF 20.5MC (Intercarrier)

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Disassembly Instructions 13
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Chassis - Top View 3
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Photographs (Cont)
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Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placment Chart (Top View) 5

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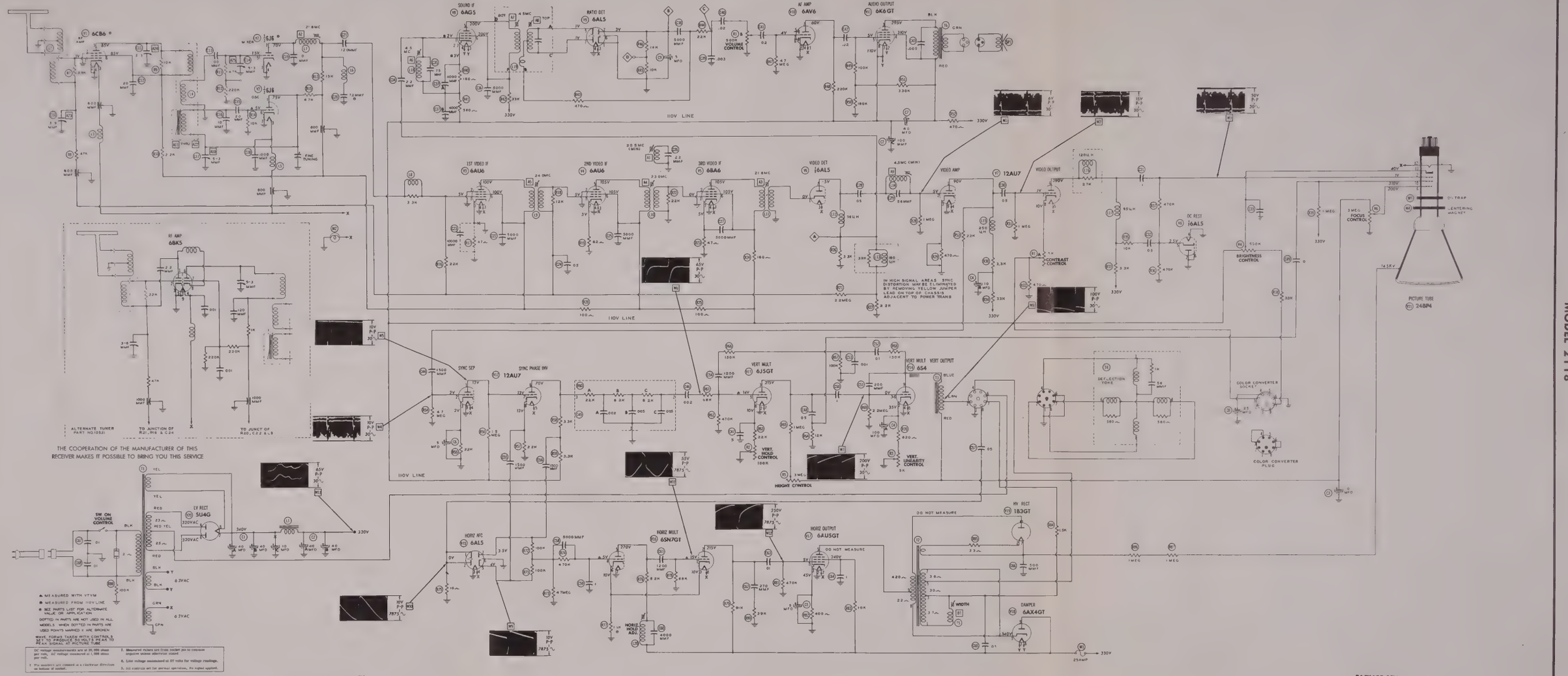
PACKARD-BELL
MODEL 2118
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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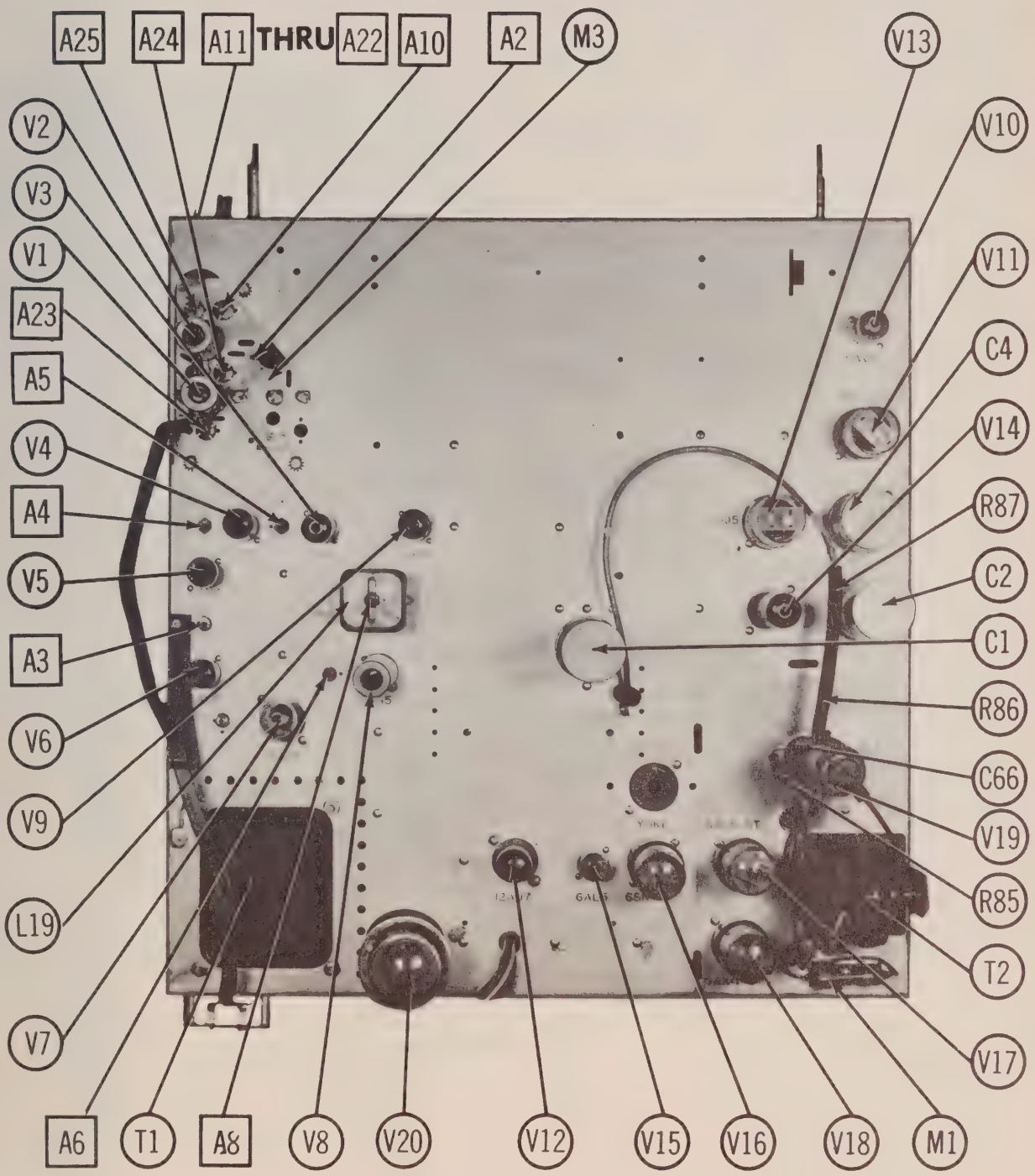
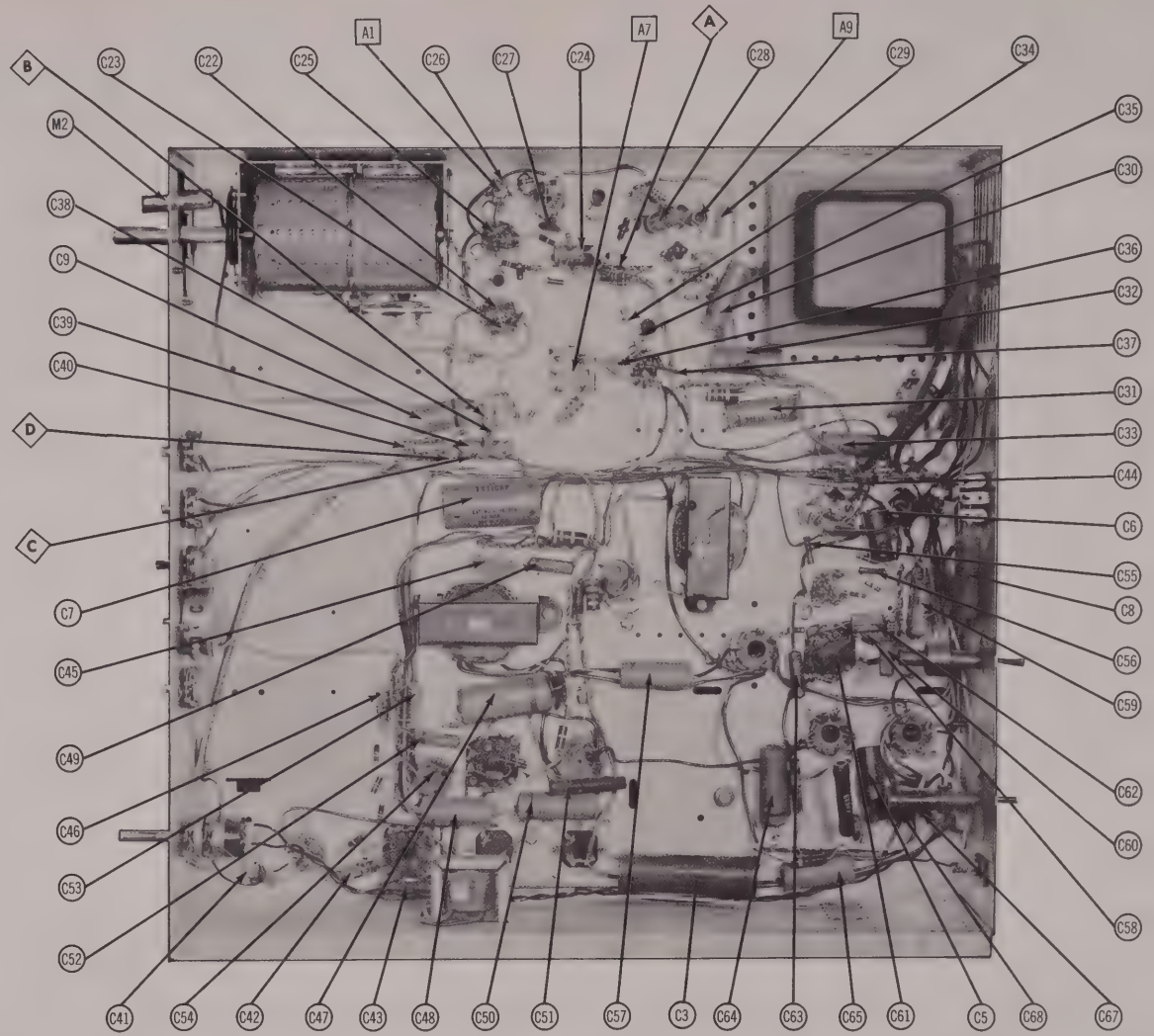
MODEL 2118

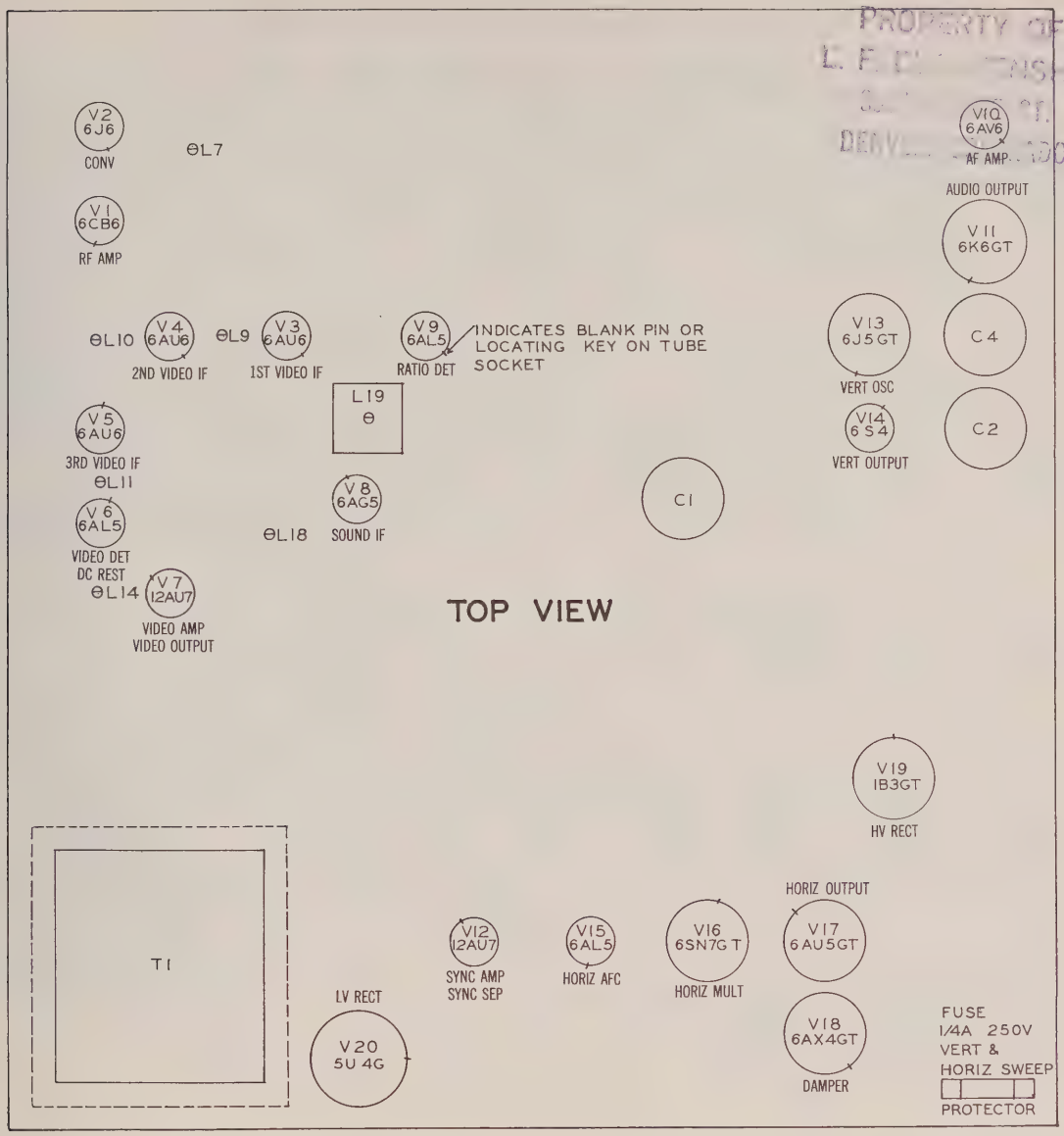


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V11
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V21
Has pic, no sound - V8, V9, V10, V11

SYNC FAILURE
No vert. sync - V12, V13, V14
No horiz. sync - V12, V15, V16
No vert. or horiz. sync - V12

SWEEP FAILURE
No raster, has sound - V16, V17, V18, V19, V21, FUSE (M1)
No vertical deflection - V13, V14
Poor vert. linearity or foldover - V13, V14
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V19, V20
Vert. off freq. - V12, V13, V14
Horiz. off freq. - V12, V15, V16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal multivibrator tube (V16).

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications. Connect the negative lead of a 1.5 volt battery to the ungrounded side of C24. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	20.5MC (Unmod)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	21.8MC	"	"	A2, A3	Adjust for maximum deflection.
3.	"	"	23.0MC	"	"	A4	"
4.	"	"	24.0MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	20.5MC 21.8MC 25.0MC	Any	Vert. amp to point (A) Low side to chassis.		Check for response similar to Fig. 1. If necessary retouch A2 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.001MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A6, A7	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point (C) Common to point (D)	A8	Adjust for a zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD	High side to point (A) Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp to point (B) Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C9. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
7.	"	"	"	"	"	Vert. amp to point (C) Low side to chassis.	A8	Reconnect capacitor C9. Adjust so that 4.5MC occurs at center of crossover lines as in Fig 3 SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig 4) to pin 2 of picture tube. Common to chassis.	A9	Adjust for MINIMUM deflection.

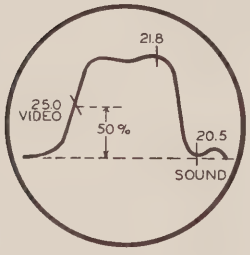


FIG. 1

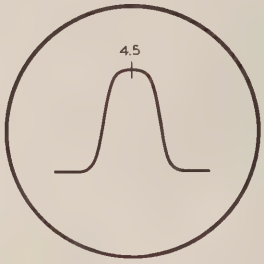


FIG. 2

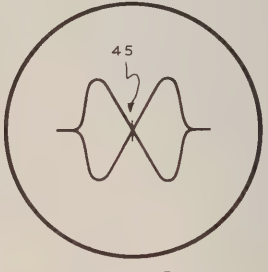


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

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[illegible]
[illegible], COLO.

OSCILLATOR ALIGNMENT

The tuner portion of this receiver has been properly aligned at the factory and is very stable. It is recommended that alignment of this portion not be attempted in the field.
Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A10. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A10 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect bias battery as under Video IF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp to point (A) Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 197.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2			

RF AND MIXER ALIGNMENT

Remove bias battery and ground tuner AGC line to chassis.
Connect the the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp thru 10KΩ to point (E) Low side to chassis.	A23, A24 A25	Adjust for response curve similar to Fig. 6.
11.	"	"	213 MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 6. If markers fall below 70% on any channel make compromise adjustments of A23, A24 and A25 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

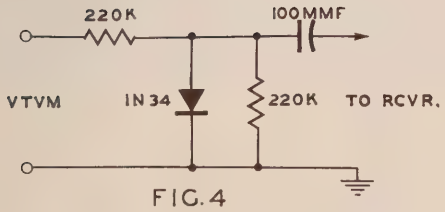


FIG. 4

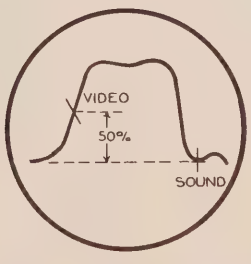


FIG. 5

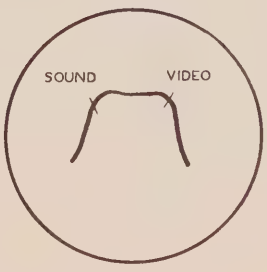
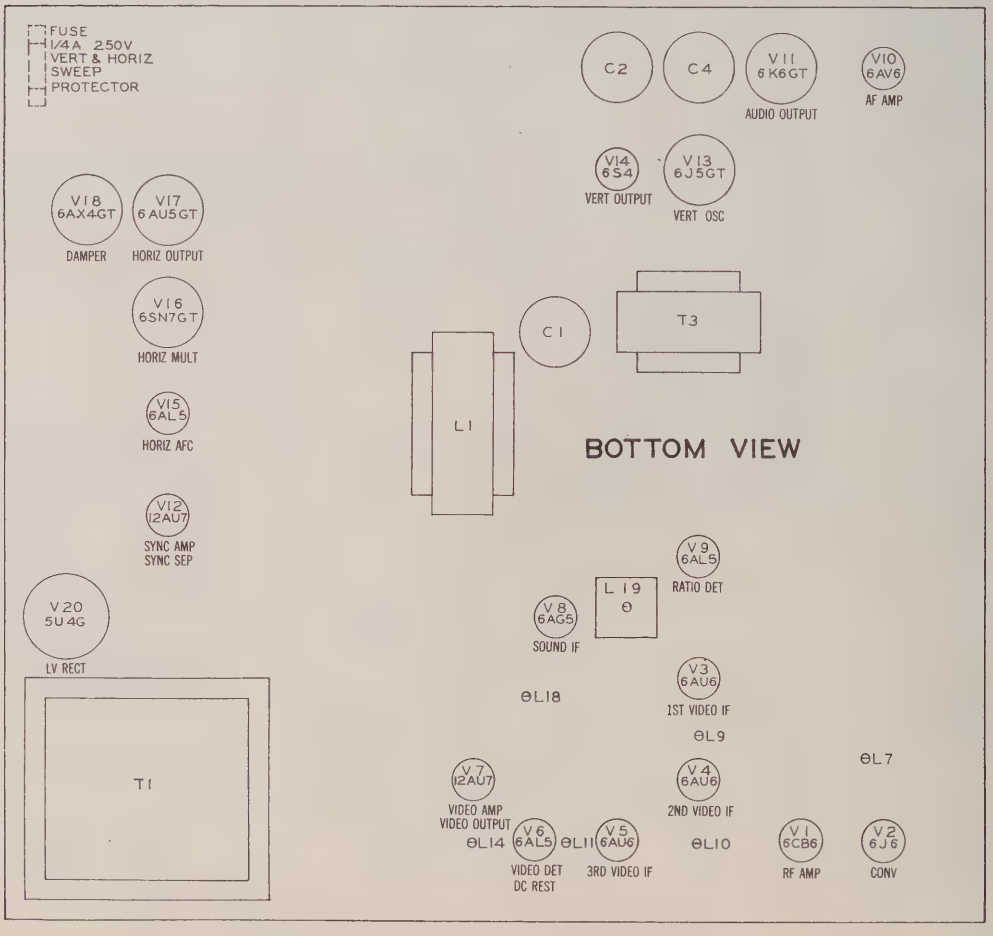


FIG. 6

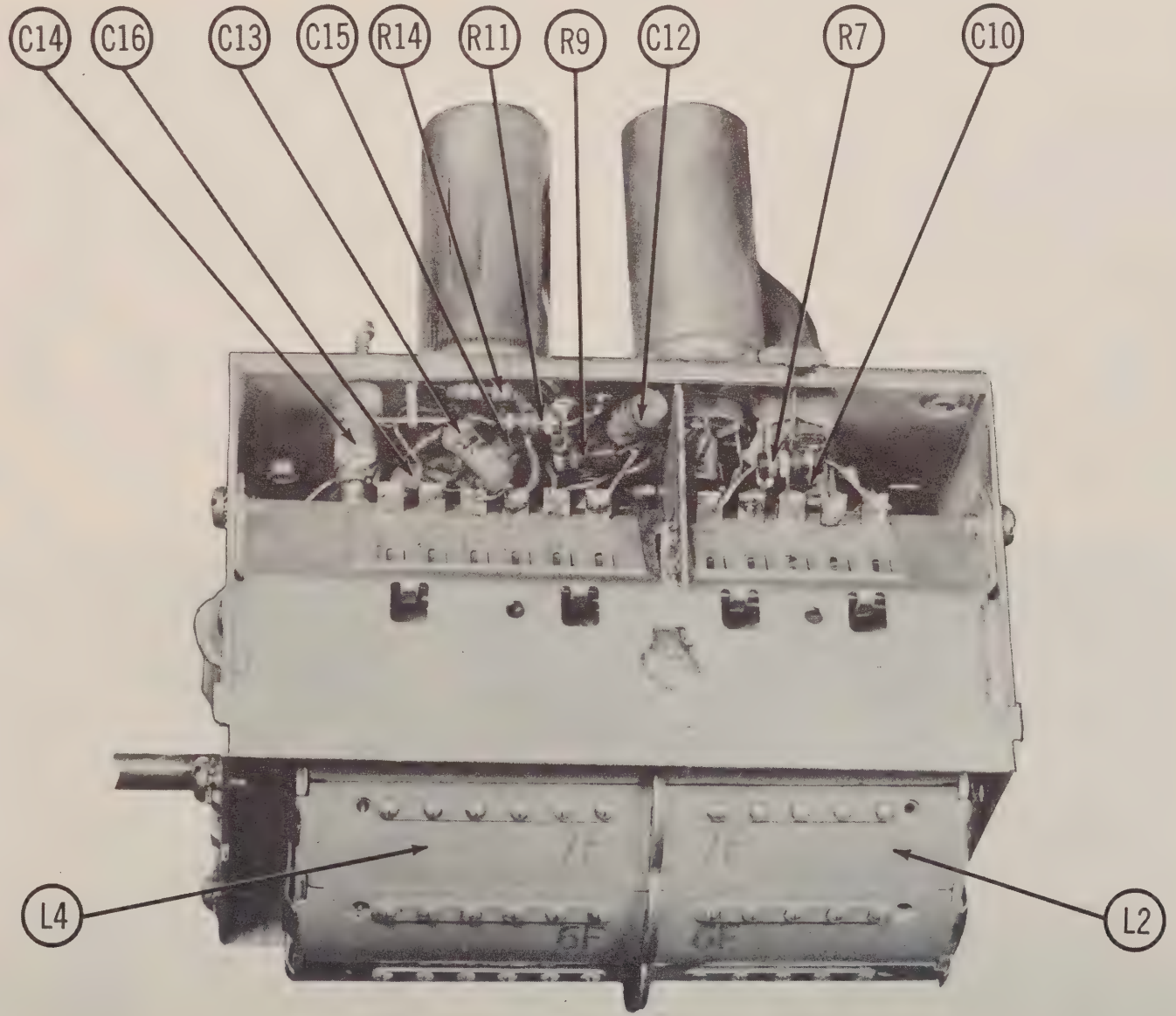
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	2.2Meg	0Ω	.1Ω	0Ω	■2.4KΩ	■2.4KΩ	0Ω		
V 2	6J6	■4.9KΩ	■15KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	2.2Meg	0Ω	.1Ω	0Ω	■200Ω	■200Ω	0Ω		
V 4	6AU6	2.2Meg	0Ω	.1Ω	0Ω	■100 Ω	■100Ω	82Ω		
V 5	6AU6	.3Ω	0Ω	.1Ω	0Ω	■180Ω	■180Ω	47Ω		
V 6	6AL5	.3Ω	0Ω	.1Ω	0Ω	470KΩ	0Ω	1.4KΩ		
V 7	12AU7	†36KΩ	1 Meg	0Ω	.1Ω	.1Ω	†3.3KΩ	1 Meg	500Ω	0Ω
V 8	6AG5	■560Ω	■740Ω	■.3Ω	■0Ω	†33KΩ	†33KΩ	■740Ω		
V 9	6AL5	0Ω	20KΩ	.1Ω	0Ω	INF	0Ω	INF		
V 10	6AV6	4.7Meg	0Ω	.1Ω	0Ω	INF	INF	■220KΩ		
V 11	6K6GT	.4Ω	■.3Ω	†1.1KΩ	†510Ω	240KΩ	140KΩ	■0Ω	150KΩ	
V 12	12AU7	■1.5Meg	4.7Meg	22KΩ	.1Ω	.1Ω	■6.6KΩ	■1.5Meg	2.2KΩ	0Ω
V 13	6J5GT	0Ω	0Ω	#1.2Meg	#150KΩ	470KΩ	#150KΩ	.1Ω	36KΩ	
V 14	6S4	INF	3.8KΩ	2.2Meg	0Ω	.1Ω	2.2Meg	INF	INF	#3.2KΩ
V 15	6AL5	10Ω	10Ω	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 16	6SN7GT	68KΩ	†91KΩ	1.5KΩ	5.1Meg	†8.2KΩ	1.5KΩ	0Ω	.1Ω	
V 17	6AU5GT	470KΩ	0Ω	400Ω	INF	#22Ω	INF	.1Ω	†10KΩ	
V 18	6AX4GT	INF	INF	220KΩ	INF	†43Ω	INF	■0Ω	■.3Ω	
V 19	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap #442Ω
V 20	5U4G	INF	150KΩ	INF	23Ω	INF	25Ω	INF	150KΩ	
V 21	24BP4	0Ω	940KΩ	Pin 6 650KΩ	Pin 10 †1 Meg	Pin 11 110KΩ	Pin 12 .1Ω			

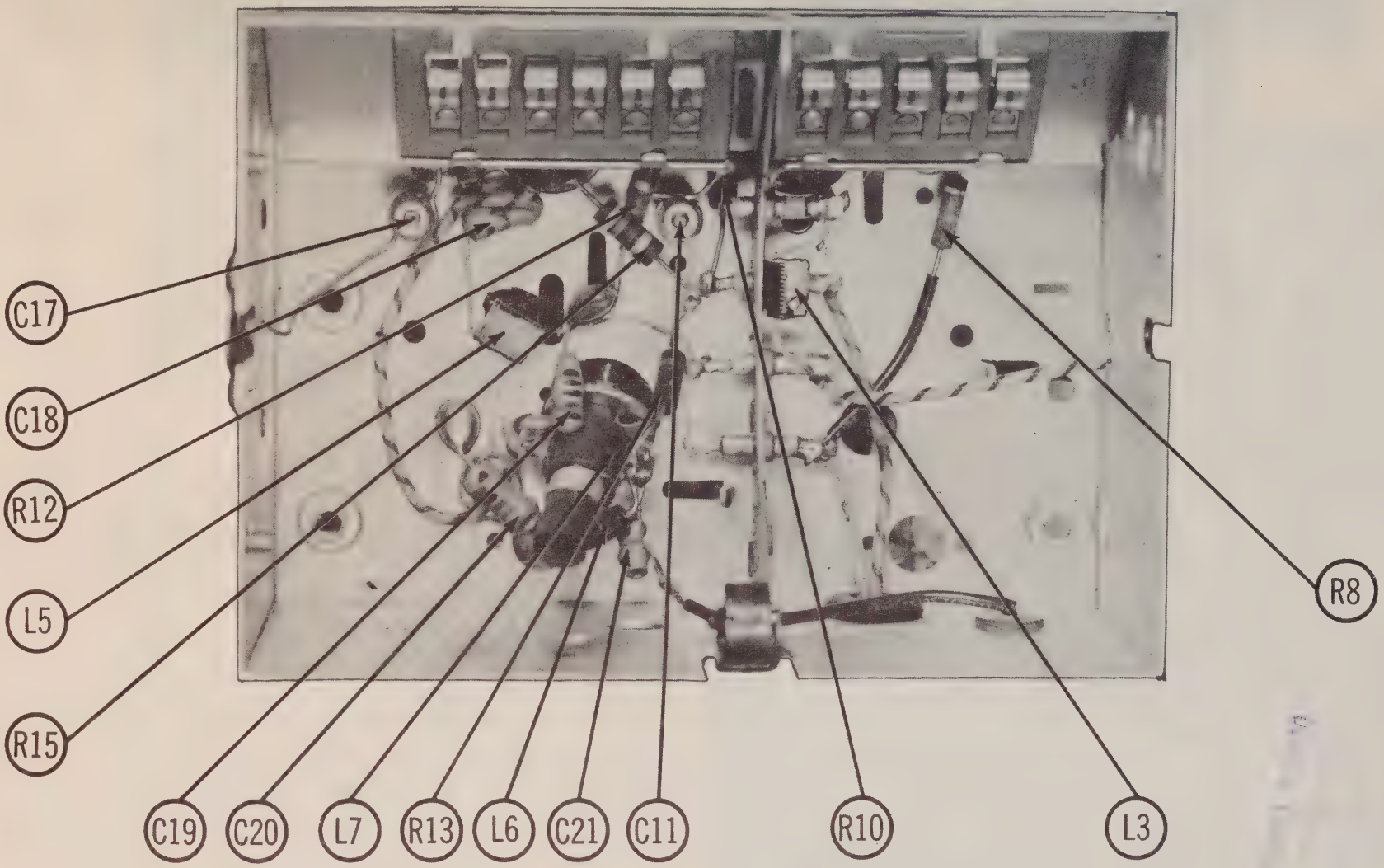
† MEASURED FROM PIN 2 OF V20
■ MEASURED FROM 110 VDC LINE
MEASURED FROM PIN 3 OF V18



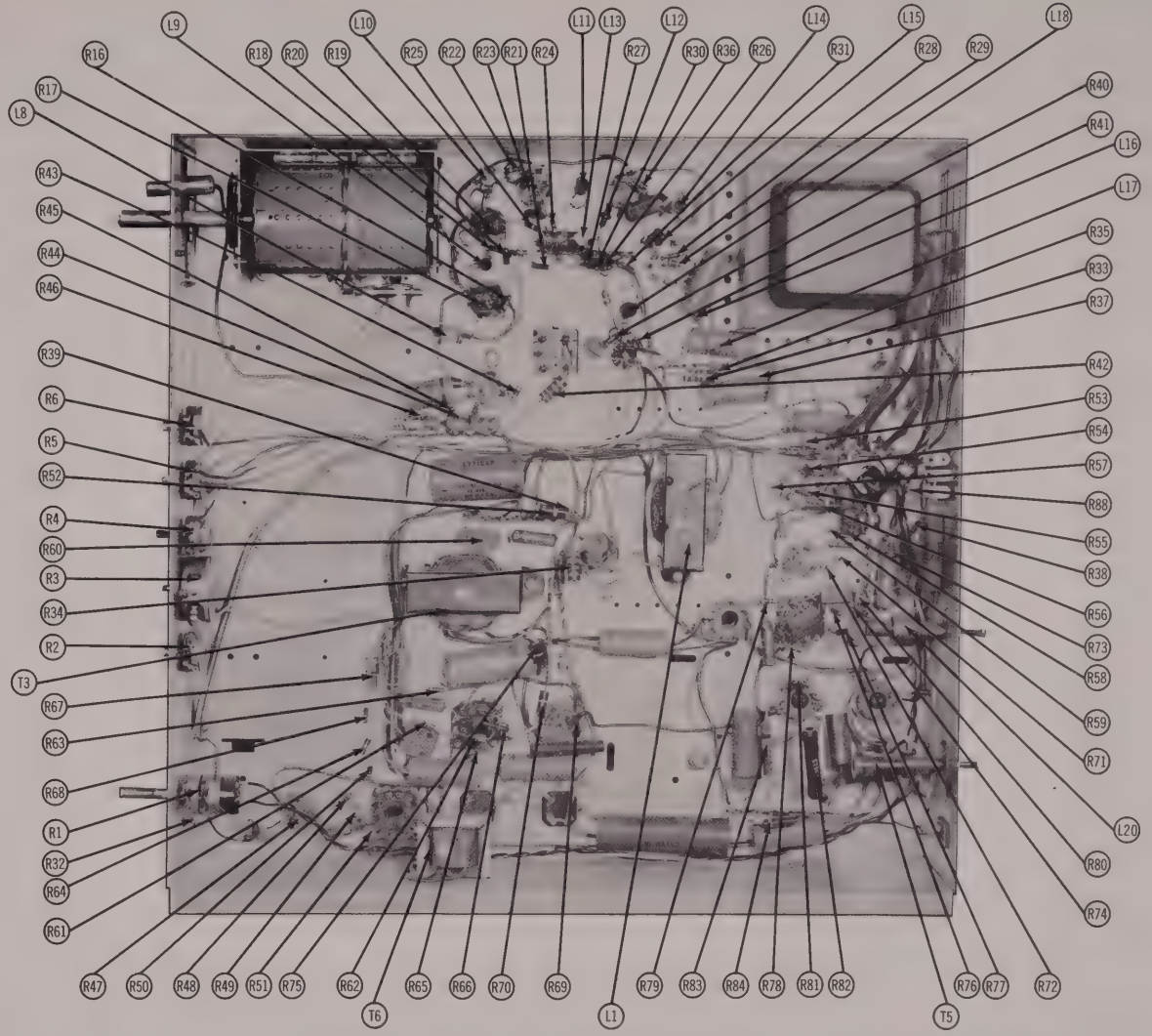
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

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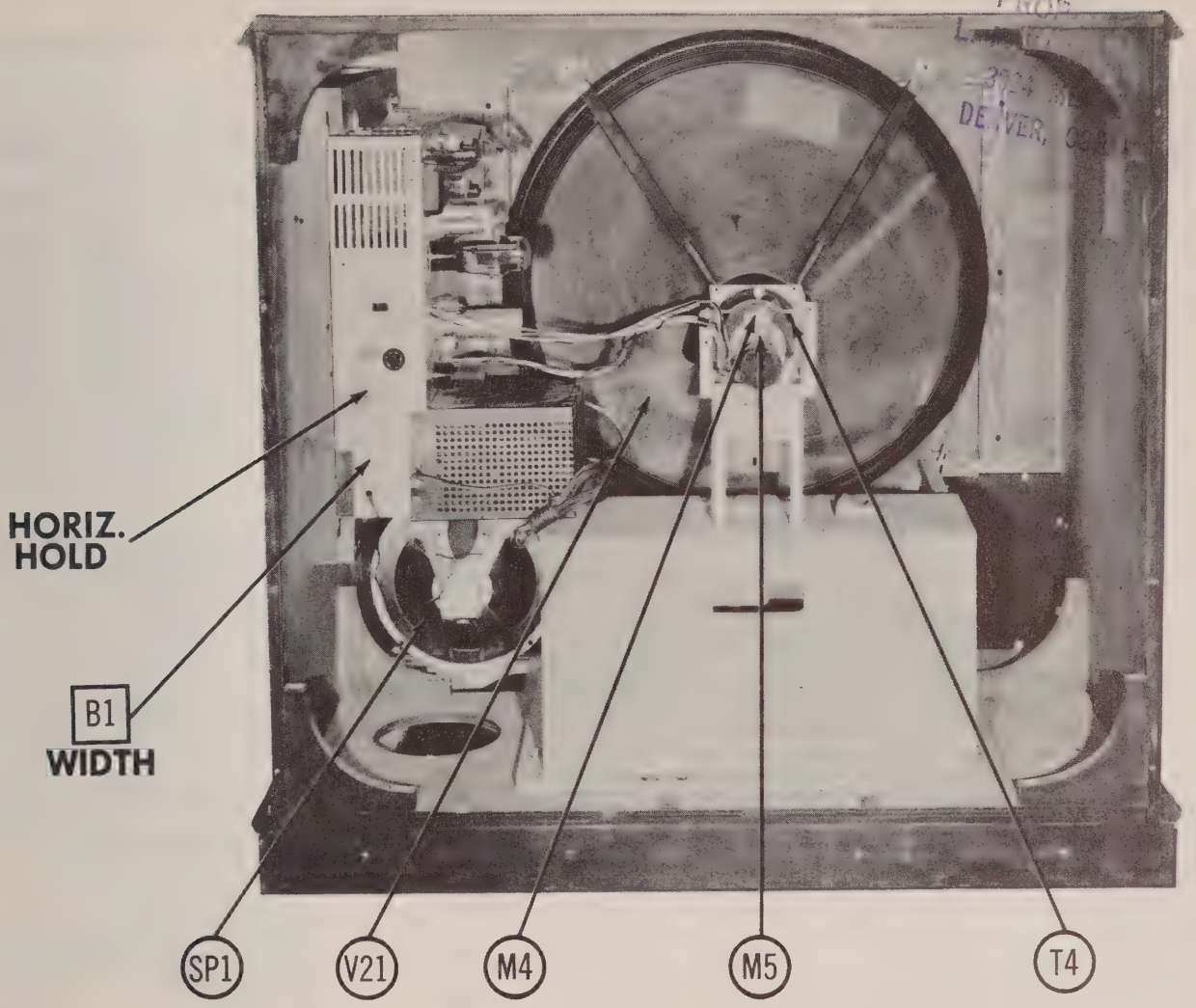
DENVER, CO



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold adjustment to synchronize the picture horizontally.

Switch to another channel and back again. If the picture does not immediately pull back into sync, retouch the hold adjustment and repeat the check.

Adjust the width slug (B1) for a picture slightly wider than necessary to fill the picture mask horizontally.

Recheck the horizontal hold adjustment.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Removel 16 wood screws. Remove rear cover.
3. Disconnect speaker, CRT socket, yoke plug & HV lead.
4. Remove 3 chassis bolts (2up, 1 down). Slide chassis out.
5. Remove 4 wood screws. Remove speaker.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6CB6	6CB6	TCM	
B	RF Amplifier	6AG5	6AG5	7BD	
C	RF Amplifier	6BK7	6BK7	9AJ	
D	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3A	1st. Video IF Amp.	6AU6	6AU6	7BK	
B	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V7	Video Amplifier-Video Output	12AU7	12AU7	9A	
V8	Sound IF Amp.	6AG5	6AG5	7BD	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier	6AV6	6AV6	7BT	
V11	Audio Output	6K8GT	6K8GT	7B	
V12	Sync Separator-Sync Phase Inv.	12AU7	12AU7	9A	
V13	Vert. Mult.	6J5GT	6J5GT	5Q	
V14	Vert. Mult.-Vert. Output	6S4	6S4	9AC	
V15	Horiz. AFC	6AL5	6AL5	6BT	
V16	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6AU5GT	6AU5GT	6CK	
V18	Damper	6AX4GT	6AX4GT	4CG	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V21	24BP4		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	24061	AFH3-159		CO41		FP398	TVL-3785	
B	■40	450								
C	▲10	500								
C2A	▲40	450	24056	AFH3-159		C11B		FP375	TVL-3764	
B	■40	450								
C	▲100	200								
C3	10	600	24068	PRS600/10		BR1V61J		TC92	TVA-1953	
C4A	▲100	50	24062	AFH2-93		BO87		FP387.1	TVL-2810	
B	▲40	450								
C5	5	50	24038	PRS150/4		BR550		TC30	TVA-1303	
C6	5	50	24038	PRS150/4		BR550		TC30	TVA-1303	
C7	40	350	24083	PRS450/40		BH4035		TC78	TVA-1811	
C8	25	25	24006A	PRS25/25		BR252A		TC26	TVA-1205	
C9	5	50	24038	PRS150/4		BR550		TC30	TVA-1303	
C10	3-8				829-10					
C11	.5-3				829-3			CT365A		
C12	120			SU20	D6-121	TM5T12	GP1K-121	UC-5312	5GA-T12	
C13	100			SU00	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C14	.5-3				829-3			CT365A		
C15	20			SI20NP0	TC2-20		NP0K-200	ZT-542	57CC-Q2	
C16	10			SI10N750	TCN-10		N750K-100	NT-541	DTCU-Q1	
C17	.5-3				829-3			CT365A		
C18	1000			SI1000	D6-102	TM5D1	GP1L-103	UC-521	5HK-D1	
C19	10			SI10NP0	TC2-10		NP0K-100 N750L-120	ZT-541	57CC-Q1	Note 1
C20	72									
C21	120			SU20	D6-121	TM5T12	GP1K-121	UC-5312	5GA-T12	
C22	5000		23931	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C23	10000		23939	BPD-01	DD-103	TM5B1	82L-01	DC-511	5HK-B1	
C24	.05	200	23017	P288-05	DF-503	PJT285		PT415	57M-S5	
C25	5000		23931	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C26	22			SI22NP0	TC2-22		NP0K-220	ZT-5423	57CC-Q22	
C27	5000		23931	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C28	.05	200	23017	P288-05	DF-503	PJT285		PT415	57M-S5	
C29	56		23922		TC2-56		NP0-333-560			
C30	.05	600	23010	P688-05	DF-503	PTE685		PT615	67M-S5	
C31	.1	600	23012	P688-1	DF-104	PTE6P1		PT601	67M-P1	
C32	.05	600	23010	P688-05	DF-503	PTE685		PT615	67M-S5	
C33	.1	200	23012	P288-1	DF-104	PJT2P1		PT401	27M-P1	
C34	2.2		23953				N750K-2R2			
C35	75			BIT5	D6-750	TM5Q75	GP1K-750	UC-5475	5GA-Q75	
C36	5000		23931	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C37A	4000		23955	BPD-2X004	D6-402	TM5DD4	822-004	DCD-524	5HK-2D4	
B	4000				D6-402					
C38	5000		23931	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C39	.003	600	23016	P688-003	D6-302	PTE6D3	GP2-333-303	PT623	67M-D3	
C40	.02	600	23007	P688-02	DF-203	PTE682		PT612	67M-S2	
C41	.02	600	23007	P688-02	DF-203	PTE682		PT612	67M-S2	
C42	.02	600	23007	P688-02	DF-203	PTE682		PT612	67M-S2	
C43	.005	600	23004	P688-005	D6-502	PTE6D5	GP2-332-502	PT625	67M-D5	
C44	1500		23936	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C45A	.002			P688-002		PTE6D2		PT623		
B	.005		•	P688-005	▲PC-100	PTE6D5	▲1405-01	PT625	▲61Q1	
C	.005			P688-005		PTE6D5		PT625		
C46	.002	600	23002	P688-002	D6-202	PTE6D2	GP2-332-202	PT623	67M-D2	
C47	.5	200		P288-5		PJT2P5		PT405	27M-P5	
C48	.05	600	23010	P688-05	DF-503	PTE685		PT615	67M-S5	
C49	.01	600	23023	P688-01	D6-103	PTE6P1	GP2-333-103	PT611	67M-S1	
C50	.1	600	23012	P688-1	DF-104	PTE6P1		PT601	67M-P1	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C51	200	3000	23958							
C52	.01	600	23023	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	67M-S1	
C53	.001	600	23001	P688-001	D6-102	PTE6D1	GP2L-102	PT621	67M-D1	
C54	1200	500	23219							
C55	1500		23936	SU1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C56	1500		23936	SH1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C57	.05	600	23010	P688-05	DF-503	PTE685		PT615	67M-S5	
C58	5000		23931	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C59	.1	200	23012	P288-1	DF-104	PJT2P1		PT401	27M-P1	
C60	4000	500	23208	1464-004		IDR5D4		MCB463	MS-24	
C61	1200	500	23219					MCB241	MS-23	
C62	270	500	23943	1469-0003		SR5T3		PT611	67M-S1	
C63	.01	600	23006	P688-01	D6-103	PTE6S1	GP2-333-103	PT601	67M-P1	
C64	.1	200	23012	P688-1	DF-104	PTE6P1		PT615	67M-S5	
C65	.05	600	23010	P688-05	DF-503	PTE685		MM-C30T5	30DK-T5	
C66	500	30000	23959	HV20C	TV3-502	MM-C20T5	413-501			
C67	.01	125VAC	23023							
C68	.01	125VAC	23023							

Note 1. Not used in all Models.
• Items C45A, C45B, C45C, R60A, R60B, R60C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	Packard-Bell PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω	½	25835A	QJ-36 *	RTV-213	8BB-527-B	UP53R } †	Contrast-Panel
B	500KΩ	½					UR55A }	Volume-Rear
C	Switch						US-26	Attach to R1B
R2A	100KΩ	½	25839	Q1J-129	AG-49-S	AB-40	SU-41	Vert. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	5000Ω	4	25807C	4WS-5000	A10-5000	SVP-989	M5MP	Vert. Linearity-Wire Wound-Note
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R3A
R4A	500KΩ	½	25832	Q1J-133	AG-58-S	AB-59	SU-50	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	3Meg	½	25805D	Q1J-140	AG-84-S	AB-84	SU-59	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	3Meg	½	25805D	Q1J-140	AG-84-S	AB-84	SU-59	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B17-114 & P1-112 (Panel) B13-133 & R2-204 (Rear) & SWITCH 76-1.
† Universal replacement (Mallory exact duplicate part #UE5258)
Note: Some Models use alternate control (Part #25807B)

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	Packard-Bell PART No.	IRC PART No.	NOTES
R7	390Ω	½		BTS-3900	
R8	47KΩ	½		BTS-47K	
R9	10KΩ	½			
R10	2200Ω	½		BTS-2200	
R11	4700Ω	½		BTS-4700	
R12	230KΩ	½		BTS-230K	
R13	15KΩ	½			
R14	10KΩ	½			
R15	4700Ω	½		BTS-4700	
R16	22KΩ	½		BTS-22K	
R17	47Ω	½			
R18	12KΩ	½			
R19	82Ω	½		BTS-82	
R20	100Ω	½		BTS-100	
R21	2.2Meg	½		BTS-2.2Meg	
R22	22KΩ	½		BTS-22K	
R23	47Ω	½			
R24	180Ω	2		BTS-180	
R25	100Ω	½		BTS-100	
R26	3300Ω	½		BTS-3300	
R27	2200Ω	½		BTS-2200	
R28	1 Meg	½		BTS-1 Meg	
R29	470Ω	½		BTS-470	
R30	3300Ω	½		BTS-3300	
R31	1 Meg	½		BTS-1 Meg	
R32	470Ω	½		BTS-470	
R33	3300Ω	2		BTS-3300	
R34	33KΩ	2		BTB-33K	
R35	10KΩ	½		BTS-10K	
R36	470KΩ	½		BTS-470K	
R37	470KΩ	½		BTS-470K	
R38	33KΩ	½		BTB-33K	
R39	1 Meg	½		BTS-1 Meg	
R40	180Ω	½		BTS-180	
R41	560Ω	½		BTS-560	
R42	33KΩ	2		BTB-33K	
R43	470Ω	½		BTS-470	
R44	22KΩ	½		BTS-22K	
R45	10KΩ	½		BTS-10K	
R46	10KΩ	½		BTS-10K	
R47	4.7Meg	½		BTS-4.7Meg	
R48	220KΩ	3		BTB-220K	

ITEM No.	RATING: OHMS	RATING: WATT	Packard-Bell PART No.	IRC PART No.	NOTES
R49	100KΩ	½		BTS-100K	
R50	180KΩ	½		BTS-180K	
R51	330KΩ	½		BTS-330K	
R52	470Ω	2		BTB-470	
R53	22KΩ	½		BTS-22K	
R54	4.7Meg	½		BTS-4.7Meg	
R55	22KΩ	½		BTS-22K	
R56	1.5Meg	½		BTS-1.5Meg	
R57	2200Ω	½		BTS-2200	
R58	3300Ω	½		BTS-3300	
R59	3300Ω	½		BTS-3300	
R60A	22KΩ	½		BTS-22K	
B	8200Ω	½	•	BTS-8200	
C	8200Ω	½		BTS-8200	
R61	68KΩ	½		BTS-68K	
R62	470KΩ	½		BTS-470K	
R63	22KΩ	½		BTS-22K	
R64	12KΩ	½		BTS-12K	
R65	1 Meg	½		BTS-1 Meg	
R66	350KΩ-5%	½		BTS-150K-5%	
R67	100KΩ	½		BTS-100K	
R68	350KΩ-5%	½		BTS-150K-5%	
R69	2.2Meg	½		BTS-2.2Meg	
R70	820Ω	1		BTA-820	
R71	100KΩ	½		BTS-100K	
R72	100KΩ	½		BTS-100K	
R73	4.7Meg	½		BTS-4.7Meg	
R74	470KΩ	½		BTS-470K	
R75	10Ω	1			
R76	8200Ω	1		BTS-8200	
R77	1500Ω	½		BTS-1500	
R78	68KΩ	½		BTS-68K	
R79	91KΩ-5%	½		BTS-91K-5%	
R80	39KΩ	½		BTS-39K	
R81	470K Ω	½		BTS-470K	
R82	400Ω	10		1 3/4A-400	
R83	10KΩ	2		BTB-10K	
R84	1500Ω	1		BTA-1500	
R85	3.3Ω	1			
R86	1 Meg	1			
R87	1 Meg	1			
R88	100KΩ	3		BTB-100K	

• Items R60A, R60B, R60C, C45A, C45B, C45C are combined in one unit.
Note. Some models use a 1800Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No.	REPLACEMENT DATA: RCA TYPE No.
T1	117VAC ⓐ1.56A	640VCT @ 3A	5VAC ⓑ1.98A SEC.1 6.3VAC ⓒ6.8V	6.3VAC ⓑ1.98A SEC.1 6.3VAC ⓒ6.8V	89042		P-3070	TP-3701	R-39BC	

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	Packard-Bell PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	442Ω tap ⓐ 22Ω	37.5Ω tap ⓐ3.7Ω 33.1Ω SEC. 2 0Ω	89435		HVO-9 ①	TPB-13	D-19 ②	22S71	Horiz. Output Trans.
T3	1700Ω tap ⓐ 4.7Ω		89434	A-8141	A-3039	TBO-12	A-104X	22S71	Vert. Output Trans.
T4A	23Ω		29539	DY-9A ①	MDF-70	TY-3 ④	Y-17	21ID2	Horiz. Deflection Coils
B	46Ω				MWC-1 ⑤			21ER1	Vert. Deflection Coils
T5	8Ω		29540						Width Coil

① Wire as in original circuit except no connection between terminal #7 and #8. No connection to terminal "F".
② No connection to terminal #7
③ Use original horiz. deflection coil network.
④ Use original deflection coil network
⑤ Enlarge mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	Packard-Bell PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	5.8KΩ	3.2Ω	618Ω	.69Ω	89427	A-3077	A-3930	RO-9 ①	S-3X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	Packard-Bell PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3.2Ω	83705	10J11	10A4A	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 ⁰	Packard-Bell PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.180ADC	43Ω	1.45 Hy.	27005	C-2325	C-2991	TR-1733 ①	C-17X

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	Packard-Bell PART No.	MILLER PART No.	MEISSNER PART No.	NOTES
L2	Ant. Coils	0Ω CT	0Ω				
L3	Fil. Choke	0Ω					
L4	RF, Mixer Grid & Osc. Coils	0Ω					
L5	Fil. Choke	0Ω					
L6	RF Choke	.4Ω					
L7	1st. Video IF	.4Ω					
L8	IF Coupling	.9Ω		29523			Wound on 3.3KΩ resistor
L9	2nd. Video IF	.3Ω	.3Ω	29055		17-1063	
L10	3rd. Video IF	.3Ω	.3Ω				Includes trap
L11	4th. Video IF	.3Ω	.3Ω	29056		17-1063	
L12	Shunt Peaking Coil	3.8Ω		29520	6176	19-3036	36 Microhenries
L13	Shunt Peaking Coil	9Ω		29508	6179	19-4180	180 Microhenries, wound on 39KΩ resistor
L14	4.5MC Trap	1.6Ω		29529	1470	20-1004	
L15	Shunt Peaking Coil	11.5Ω		29507	6161	19-3250	250 Microhenries
L15	Series Peaking Coil	7Ω		29506 •	6178	19-4125	120 Microhenries, wound on 27KΩ resistor
L17	Shunt Peaking Coil	13Ω		29509	6177	19-3093	95 Microhenries
L18	Sound IF	1.2Ω		29053	1469	30-1005	
L19	Ratio Det.	4.3Ω	.40CT	29054	6205 * *	17-3493	Tertiary Winding -1.4Ω
L20	Horiz. Osc.	120Ω		29527	6210	19-1576	

* Use adaptor plate.

FUSES

ITEM No.	TYPE	RATING	Packard-Bell PART No. FUSE	Packard-Bell PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1/4A 250V	45004		312.250 (3AG-1/4A)	357001	AGC-1/4	4405

PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Packard-Bell PART No.		
M2	Bayonet	6-8	.15	Brown	54001		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M3A	RF Tuner	10530	
B	RF Tuner	10531	(Field Replacement only, fringe reception)
M4	Centering magnet	28075	
M5	Ion Trap	28049	
	Knob	52076-1	Channel Selector (State color)
	Knob	52069-1	Off/On Volume (State color)
	Knob	52070	Contrast & Fine tuning (State color)
	Nameplate	41038	
	Mask	55031	
	Safety Glass	55030	
	Escutcheon	41041	Control Door
	Escutcheon	41042	Crest

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

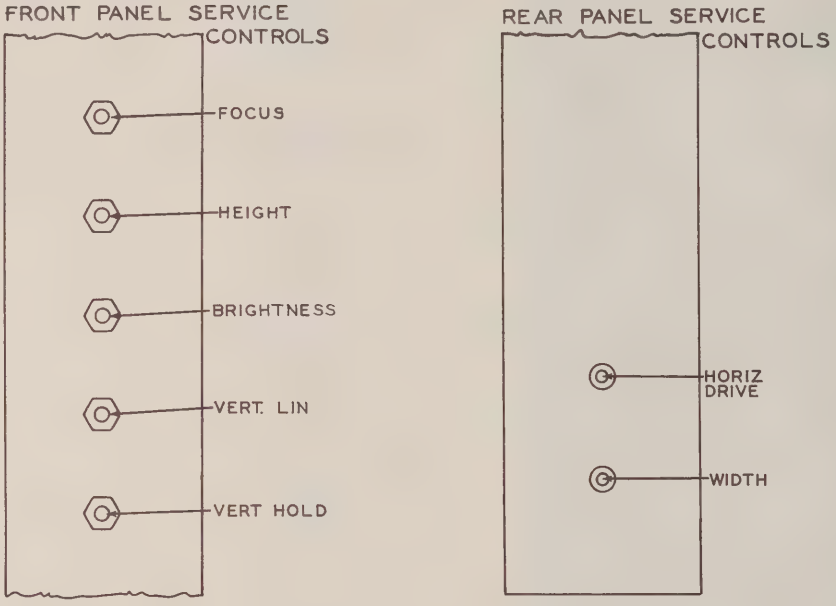
PICTURE TUBE SAFETY GLASS CLEANING

For picture safety glass cleaning, it is necessary to remove picture tube (See Picture Tube Removal).

PICTURE TUBE REMOVAL

Picture tube may be removed without removing chassis. Disconnect CRT socket, yoke plug and H. V. leads. Unhook two spring braces from yoke bracket. Remove four bolts from mounting picture tube support platform and remove entire assembly from cabinet.

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator. Adjustment is located on the rear panel of the chassis. Adjust the horizontal hold slug untill picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary (L19) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for Horizontal Sweep Circuit protection. (For location, see Tube Placement Chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

L. C.
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DENVER

PROPERTY OF
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DENVER, COLORADO

FUNCTION SELECTOR

BASS CONTROL

VOLUME CONTROL

TREBLE CONTROL ON-OFF SW

TUNING CONTROL

RADIO CRAFTSMEN
MODEL 800

TRADE NAME	Radio Craftsmen Model 800
MANUFACTURER	The Radio Craftsmen, Inc., 4401 N. Ravenswood Ave., Chicago 40, Ill.
TYPE SET	AC Operated AM-FM Superheterodyne Tuner for Custom Installation
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC-60 Cycles
TUNING RANGE- BROADCAST	450-1620KC RATING FM 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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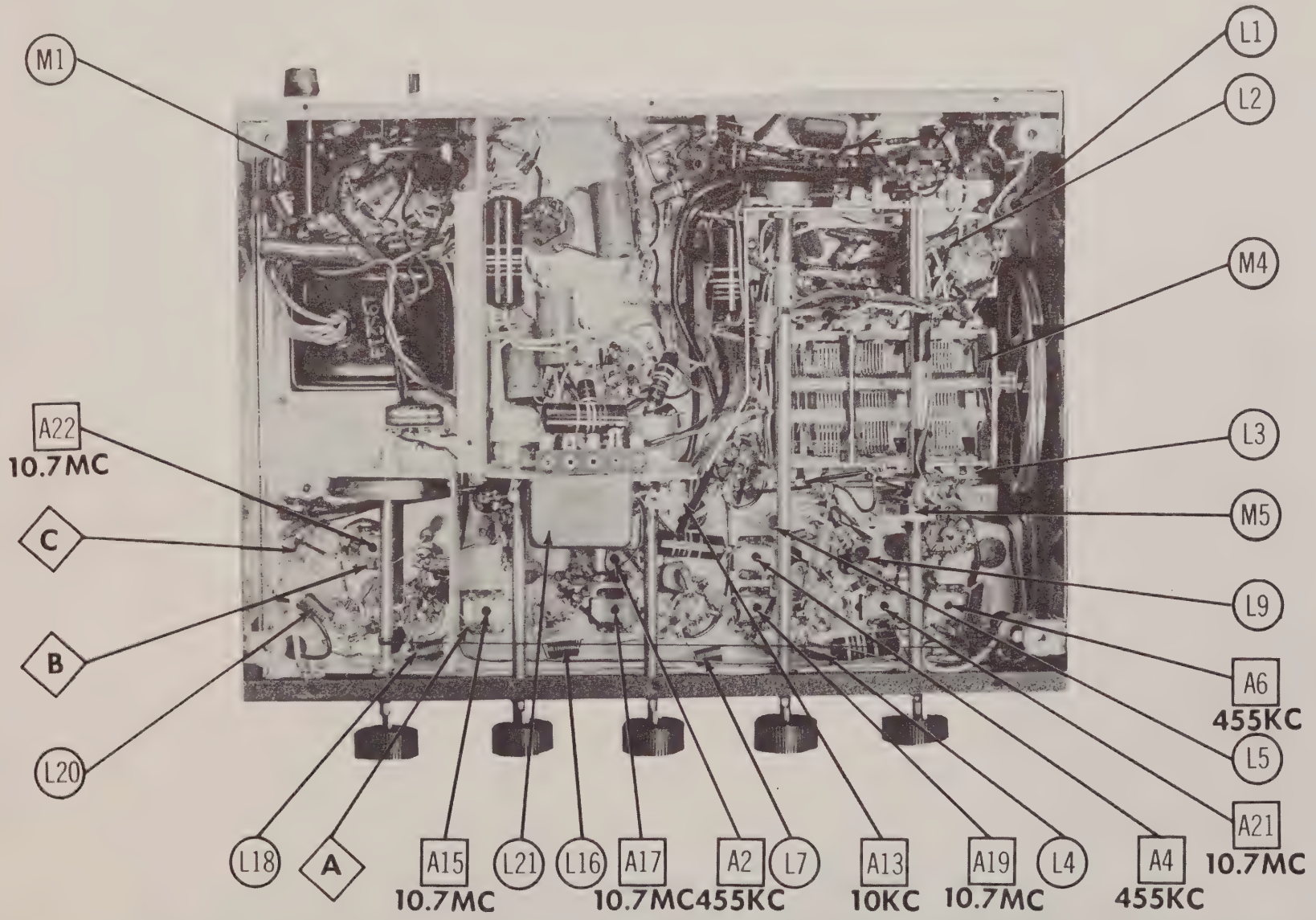


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CRAFTSMEN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	FM RF Amplifier	6CB6	6CB6	7CM	
V2	FM-AM Mixer	12AT7	12AT7	9A	
V3	FM-AM Osc. -AFC	12AT7	12AT7	9A	
V4	AM RF Amplifier	6BJ6	6BJ6	7CM	
V5	1st. FM-AM IF Amp	6BJ6	6BJ6	7CM	
V6	2nd FM-AM IF Amp	6AU6	6AU6	7BK	
V7	3rd FM IF Amp.	6AU6	6AU6	7BK	
V8	1st. FM Limiter	6AU6	6AU6	7BK	
V9	2nd. FM Limiter	6AU6	6AU6	7BK	
V10	FM Discriminator	6AL5	6AL5	6BT	
V11	AM Det. -AVC-AF Amp.	6AV6	6AV6	7BT	
V12	Tuning Indicator	6AL7GT	6AL7GT	8CH	
V13	Phono Pre-Amp.	12AX7	12AX7	9A	
V14	Cathode Follower	12AX7	12AX7	9A	
V15	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CRAFTSMEN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	300	18S022	AFH4-93		D092		FP428.4	TVL-4720	
B	■40	300								
C	▲30	300								
D	20	300								
C2A	▲10	300	18S037	AFH3-28		CO22		FP330.7	TVL-3570	
B	■40	300								
C3	25	25	CEH0202P	PRS25/25		BR252A		TC26	TVA-1205	
C4	25	25	CEH0202P	PRS25/25		BR252A		TC26	TVA-1205	
C5	25	25	CEH0202P	PRS25/25		BR252A		TC26	TVA-1205	
C6	10		CC20SL100M	SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C7	220		CC20SL221M	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C8	150		CC20SL151M	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C9	220		CC20SL221M	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C10	47		CC20UK470M	SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C11	220		CC20SL221M	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C12	5000		18X701	BPD-005	DD-502	TM5D5	811-005	DC-521	5HK-D1	
C13	5000		18X701	BPD-005	DD-502	TM5D5	811-005	DC-521	5HK-D1	
C14	5000		18X701	BPD-005	DD-502	TM5D5	811-005	DC-521	5HK-D1	
C15	22		CC20CK220M	SI22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C16	15		CC20SL150M	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C17	22		CC20CK220M	SI22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C18	2		CC20CK2R0D							
C19	220		CC20SL221M	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C20	100		CC20SL101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C21	47		CC200K470M	SI47	D6-470	TM5Q47	GP1K-470	UC-5447	5GA-Q47	
C22	10000		18X704	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C23	220		CC20SL221M	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C24	2		CC20CK2R0D							
C25	10000		18X704	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C26	.047	400	CP10M4473K	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C27	10000		18X704	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C28	10000		18X704	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C29	10000		18X704	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C30	10000		18X704	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C31	680	500	CM20A681J	1479-0007		5R5T7			MS-37	
C32	10000		18X704	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C33	10000		18X704	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C34	680	500	CM20A681J	1479-0007		5R5T3			MS-37	
C35	.047	400	CP10M4473K	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C36	680	500	CM20A681J	1479-0007	D6-681	1W5T7	GP2K-681		1FM-37	
C37	5000		18X701	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C38	.047	400	CP10M4473K	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C39	5000		18X701	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	Note 1
C40	680	500	CM20A681J	1479-0007	D6-681	1W5T7	GP2K-681		1FM-37	
C41	680	500	CM20A681J	1479-0007	D6-681	1W5T7	GP2K-681		1FM-37	
C42	2200		18X708	BPD-0022	D6-222	PTE6D22	GP2-333-222	UC-5222	5HK-D22	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CRAFTSMEN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R21	15KΩ	1	RC30AE153K	BTA-15K	
R22	33Ω	1/2	RC20AE330K		
R23	2200Ω	1/2	RC20AE222K	BTS-2200	
R24	680Ω	1/2	RC20AE681K	BTS-680K	Note
R25	10KΩ	1/2	RC20AE103K	BTS-10K	
R26	220KΩ	1/2	RC20AE224K	BTS-220	
R27	68Ω	1/2	RC20AE680K		
R28	3900Ω	1	RC30AE392K	BTA-3900	
R29	1500Ω	1/2	RC20AE152K	BTS-1500	
R30	15KΩ	1	RC30AE153K	BTA-15K	
R31	220Ω	1/2	RC20AE221K	BTS-220	
R32	47KΩ	1/2	RC20AE473K	BTS-47K	
R33	15KΩ	1	RC30AE153K	BTA-15K	
R34	33KΩ	1/2	RC20AE333K	BTS-33K	
R35	100KΩ	1/2	RC20AE104K	BTS-100K	
R36	10KΩ	1/2	RC20AE103K	BTS-10K	
R37	22KΩ	1	RC30AE223K	BTA-22K	
R38	15KΩ	1/2	RC20AE153K	BTS-15K	
R39	150KΩ	1/2	RC20AE154K	BTS-150K	
R40	47KΩ	1	RC30AE473K	BTA-47K	
R41	100KΩ	1/2	RC20AE104K	BTS-100K	
R42	100KΩ	1/2	RC20AE104K	BTS-100K	
R43	150KΩ	1/2	RC20AE154K	BTS-150K	
R44	470KΩ	1/2	RC20AE474K	BTS-470K	
R45	1 Meg	1/2	RC20AE105K	BTS-1 Meg	
R46	6.8Meg	1/2	RC20AE685K	BTS-6.8Meg	
R47	3300Ω	1/2	RC20AE332K	BTS-3300	
R48	2700Ω	1	RC30AE272K	BTA-2700	
R49	1 Meg	1/2	RC20AE105K	BTS-1 Meg	
R50	100KΩ	1/2	RC20AE104K	BTS-100K	
R51	22KΩ	1/2	RC20AE223K	BTS-22K	
R52	10KΩ	1/2	RC20AE103K	BTS-10K	
R53	2700Ω-5%	2	RW1272J	BW-2-2700-5%	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CRAFTSMEN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R54	220KΩ-5%	1	RC30AE224J	BTA-220K-5%	
R55	1 Meg	1/2	RC20AE105K	BTS-1 Meg	
R56	1800Ω	1/2	RC20AE182K	BTS-1800	
R57	100KΩ	1	RC30AE104K	BTA-100K	
R58	10KΩ	1/2	RC20AE103K	BTS-10K	
R59	100KΩ-5%	1/2	RC20AE104J	BTS-100K-5%	
R60	2.4Meg-5%	1/2	RC20AE245J	BTS-2.4Meg-5%	
R61	680KΩ-5%	1/2	RC20AE684J	BTS-680K-5%	
R62	20KΩ-5%	1/2	RC20AE203J	BTS-20K-5%	
R63	20KΩ-5%	1/2	RC20AE203J	BTS-20K-5%	
R64	51KΩ-5%	1/2	RC20AE513J	BTS-51K-5%	
R65	470KΩ	1/2	RC20AE474K	BTS-470K	
R66	470Ω	1/2	RC20AE471K	BTS-470	
R67	22KΩ	1/2	RC20AE223K	BTS-22K	
R68	220KΩ	1	RC30AE224K	BTA-220K	
R69	47KΩ-5%	1/2	RC20AE473J	BTS-47K-5%	
R70	47KΩ-5%	1/2	RC20AE473J	BTS-47K-5%	
R71	4700Ω-5%	1/2	RC20AE472J	BTS-4700-5%	
R72	1500Ω	1/2	RC20AE152K	BTS-1500	
R73	6800Ω	1/2	RC20AE682K	BTS-6800	
R74	470KΩ	1/2	RC20AE474K	BTS-470K	
R75	470Ω	1/2	RC20AE471K	BTS-470K	
R76	22KΩ	1/2	RC20AE223K	BTS-22K	
R77	1600Ω	1/2	RC20AE152K	BTS-1500	
R78	1 Meg	1/2	RC20AE105K	BTS-1 Meg	
R79	1 Meg	1/2	RC20AE105K	BTS-1 Meg	
R80	220Ω	2	RW2221	BW-2-220	
R81	750Ω	10	RWX751K	1 3/4A-750	
R82	2200Ω	1	RC30AE222K	BTA-2200	
R83	150KΩ	1/2	RC20AE154K	BTS-150K	
R84	33KΩ	1/2	RC20AE333K	BTS-33K	
R85	.47Ω	5	RW5R47K		

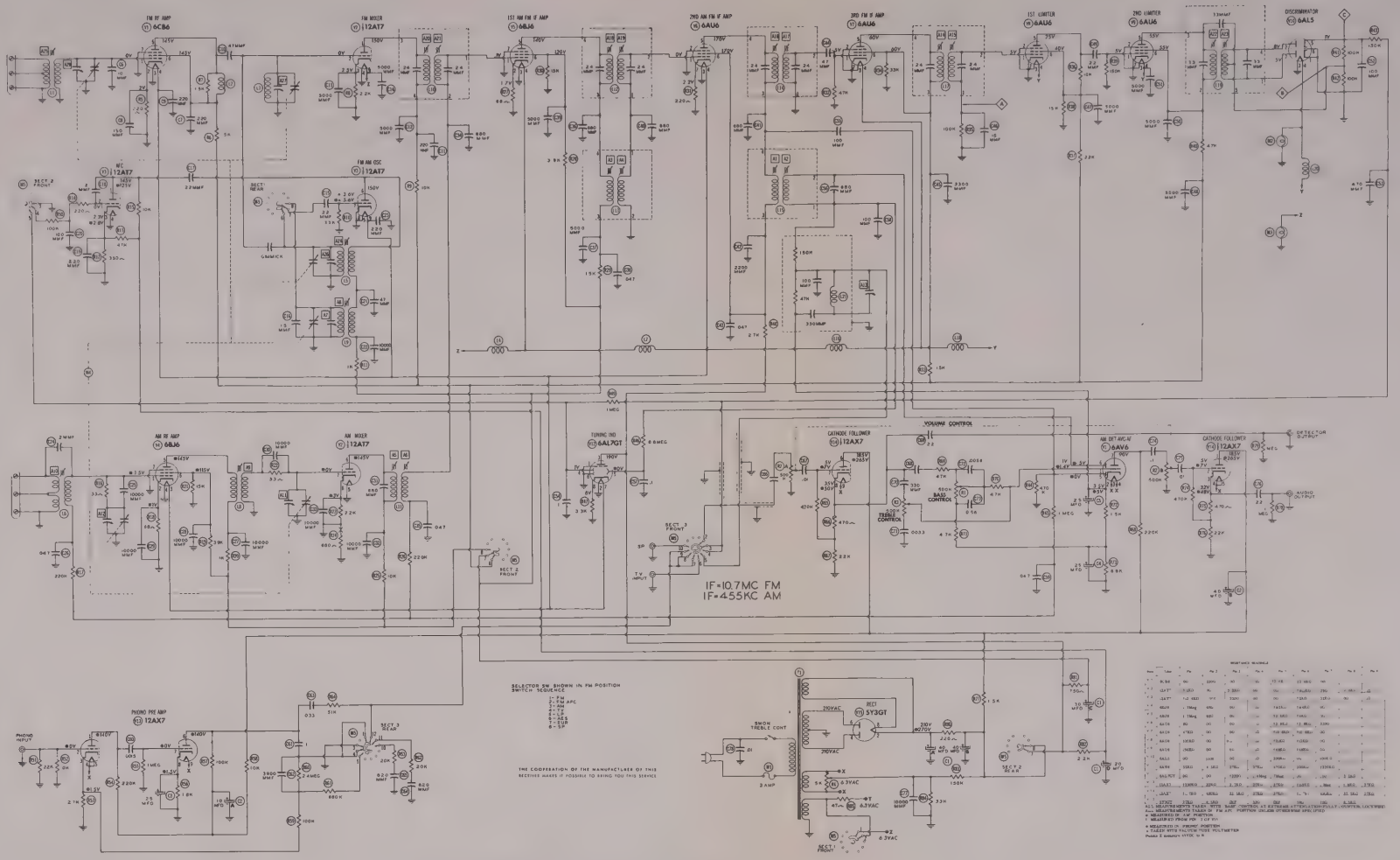
Note . Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: CRAFTSMEN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @.57A	420VCT .070ADC	5VAC @2A	6.3VAC @.86A SEC. 4 6.3VAC @3.3A	19S213				

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: CRAFTSMEN PART No.	MILLER PART No.	MEISSNER PART No.	IRC PART No.	NOTES
L1	FM Ant. Coil	0Ω	0Ω	5A242				Pri. tapped
L2	FM RF Choke	2Ω		LW13R3K	4608		CL-1	3.3 Microhenries
L3	FM RF Coil	0Ω		5A238				
L4	Fil. Choke	0Ω		5X406	4604			1.5 Microhenries
L5	FM Osc. Coil	0Ω	0Ω	5A237	1474 *			
L6	AM Ant. Coil	30Ω	4.8Ω	5A202B				Pri. tapped @.1Ω
L7	Fil. Choke	0Ω		5X406	4604			1.5 Microhenries
L8	AM RF Coil	110Ω	5.7Ω	5A219A	73-RF ■	14-7558 ■		
L9	AM Osc. Coil	.8Ω	4.8Ω	5A240	70-OSC			Sec. tapped @.5Ω
L10	1st. FM IF	1Ω	1Ω	5X014	1463	16-3487		
L11	1st. AM IF	8Ω	7.5Ω	5A022	12-C1	16-6758		
L12	2nd. FM IF	1Ω	1Ω	5X014	1463	16-3487		
L13	2nd. AM IF	5Ω	5Ω	5A021	12-C1	16-6758		
L14	3rd. FM IF	1Ω	1Ω	5X014	1463	16-3487		
L15	3rd. AM IF	5Ω	5Ω	5A021	12-C1	16-6758		
L16	Fil. Choke	0Ω		5X406	4604			1.5 Microhenries
L17	4th. FM IF	1Ω	1Ω	5X014	1463	16-3487		
L18	Fil. Choke	0Ω		5X406	4604			1.5 Microhenries



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

204-8

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA CRAFTSMEN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTE
C43	.047	400	CP10M4473K	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C44	47		CC20UK470M	SI47	D6-470		GP1K- 470	UC-5447	5GA-Q47	
C45	3300		18X709	BPD-0033	D6-332	PTE6D33	GP2-333-332	UC-5233	5HK-D33	
C46	15		CC20SL150M	SI15	D6-150	5W5Q15	GP1K-150	UC-5415	5GA-Q15	
C47	5000		18X701	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C48	5000		18X701	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C49	22		CC20SL220M	SI22	D6-220	5W5Q25	GP1K-220	UC-5422	5GA-Q22	
C50	5000		18X701	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C51	5000		18X701	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C52	100		CC20SL101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C53	470		CM20A471K	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C54	.1	400	CP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C55	100		CC20SL101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C56	680	500	CM20A681J	1479-0007		5R5T7			MS-37	
C57	.1	400	CP10M4104K	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C58	100		CC20SL101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C59	.047	400	CP10M4473K	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C60	.0015	400	CP10M4152K	P688-0015	D6-152	PTE6D15	GP2L-152	PT6215	6TM-D15	
C61	.1	400	CP10M4104K	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C62	3900	500	CM20A392J	1464-004		1DR5D4		MCB463	MS-24	
C63	.033	400	CP10M4333K	P488-033		PTE4S3		PT4133	4TM-S3	
C64	820	500	CM20A821J							
C65	820	500	CM20A821J							
C66	.1	400	CP10M4104K	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C67	.01	400	CP10M4103K	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C68	.1	400	CP10M4104K	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C69	.22	200	CP10M2229K	P488-22		PTE4P22		PT4025	4TM-P22	
C70	330	500	CM20A331K	1469-00035						
C71	.0033	600	CP10M4332K	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D33	
C72	.0056	400	CP10M4536K							
C73	.056	400	CP10M4563K							
C74	.1	400	CP10M4104K	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C75	.01	400	CP10M4103K	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C76	.22	200	CP10M2229K	P488-22		PTE4P22		PT4025	2TM-P22	
C77	10000		18X704	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C78	.01	600	CP10M6103K	689ZX-01		PJ6S1		PT611	6TM-S1	

Note 1. Some Models use 2200MMF in this application (part #18X078)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CRAFTSMEN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	23S734	Q13-133	AG-60-Z	B-60	U-48	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	23S733	Q13-133	*			Volume
B	500KΩ	½		M11-133				
R3A	500KΩ	½	23S732	Q13-133	AG-60-Z		U-48	Treble
B	Shaft		Not Req.	*	FS-5		DS-36	Attach to R3A
C	Switch		Not Req.	76-1	SWB		US-26	Attach to R3A
R4A	5000Ω	½	23S724	Q11-114	AG-19-S	AB-10	SU-14	Hum Balance-Note
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A

* Use IRC coupler C3 and a portion of the original control shaft to duplicate original.
Note. Not used in all models.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CRAFTSMEN PART No.	IRC PART No.	NOTES
R5	220Ω	½	RC20AE221K	BTS-220	
R6	1500Ω	½	RC20AE152K	BTS-1500	
R7	1500Ω	½	RC20AE152K	BTS-1500	
R8	2200Ω	½	RC20AE222K	BTS-2200	
R9	10KΩ	½	RC20AE103K	BTS-10K	
R10	33KΩ	½	RC20AE333K	BTS-33K	
R11	1000Ω	½	RC20AE102K	BTS-1000	
R12	330Ω	½	RC20AE331K	BTS-330	
R13	47KΩ	1	RC30AE473K	BTA-47K	
R14	220Ω	½	RC20AE221K	BTS-220	
R15	10KΩ	1	RC30AE103K	BTA-10K	
R16	33Ω	½	RC20AE330K		
R17	220KΩ	½	RC20AE224K	BTS-220K	
R18	68Ω	½	RC20AE680K		
R19	3900Ω	1	RC30AE392K	BTA-3900	
R20	1000Ω	½	RC20AE102K	BTS-1000	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS RF-IF (CONT.)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CRAFTSMEN PART No.	MILLER PART No.	MEISSNER PART No.	IRC PART No.	NOTES
L19	Discriminator	.8Ω	1Ω CT	5X005	1464			1.5 Microhenries
L20	Fil. Choke	0Ω		5X406	4604			Includes 220Ω resistor,
L21	10KC Filter	3500Ω		19S413				47KΩ resistor, 100MMF capacitor & 330MMF capacitor

* Enlarge mounting hole.
■ Drill new mounting holes.

FUSES

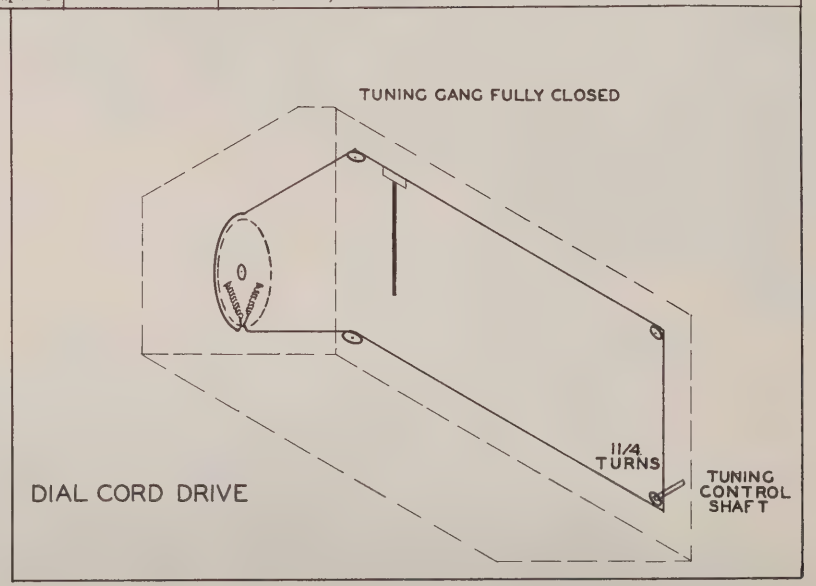
ITEM No.	TYPE	RATING	REPLACEMENT DATA CRAFTSMEN PART No. FUSE	CRAFTSMEN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	2A 250V			312002 (3AG-2A)	341001	AGC-2	HKP

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA CRAFTSMEN PART No.		NOTES
M2	Bayonet	6-8	.25	Blue	15X003		Type #44
M3	Bayonet	6-8	.25	Blue	15X003		Type #44

MISCELLANEOUS

ITEM No.	PART NAME	CRAFTSMEN PART No.	NOTES
M4	Tuning Capacitor	17B008	31-335MMF, 31-335MMF, 27-200MMF (Also includes 3FM units)
M5	Switch	4S011	Function Selector
A13	Trimmer Capacitor		10KC Filter, 200-400MMF



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2B) Low side to chassis.	455KC (400∿Mod)	AM	Point of non-interference	Across Audio Output	A1, A2, A3, A4, A5, A6	Adjust for maximum output.
2.	"	"	592.5KC to 607.5KC	"	Tune to 600KC signal	"	"	Short AVC to chassis. Adjust for maximum at 600KC with symmetrical reduction of response to 50% response at 592.5KC and 607.5KC points.
3.	220MMF	High side to AM antenna input. Low side to chassis.	1500KC	"	1500KC	"	A7	Adjust for maximum output.
4.	"	"	600KC	"	Tune to 600KC signal	"	A8, A9, A10	Adjust in order given for maximum output.
5.	"	"	1500KC	"	1500KC	"	A7	Adjust for maximum output.
6.	"	"	1400KC	"	Tune to 1400KC signal	"	A11, A12	"
7.		Repeat steps 4, 5, and 6.						
8.	220MMF	High side to AM antenna input. Low side to chassis.	1400KC (10KC Mod)	AM	Tune to 1400KC signal	Across audio output	A13	Adjust for MINIMUM 10KC output

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2A) Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference.	DC probe to point Ⓐ Common to chassis.	A14, A15, A16, A17, A18, A19, A20, A21, A22	Adjust for maximum deflection.
10.	"	"	"	"	"	DC probe to point Ⓑ Common to chassis.	A22	"
11.	"	"	"	"	"	DC probe to point Ⓒ Common to chassis.	A23	Adjust for a zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2A). Low side to chassis.	10.7MC	FM	Point of non-interference.	Vert. amp to point Ⓐ Low side to chassis.	A14, A15, A16, A17, A18, A19, A20, A21	Adjust for curve of maximum amplitude and symmetry as in Fig. 1. Attentuate generator output to avoid distortion of response curve.
10.	"	"	"	"	"	Vert. amp to point Ⓑ Low side to chassis.	A22	"
11.	"	"	"	"	"	Vert. amp to point Ⓒ Low side to chassis.	A23	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A22 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

Turn selector switch fully counter clockwise so that AFC is inoperative.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across FM Ant. terminals with 120Ω in each lead.	90MC (50KC Swp)	FM	90MC	Across audio output	A24, A25, L3	Adjust A24 and A25 and compress or expand L3 for maximum output.
13.	"	"	106MC (50KC Swp)	"	106MC	"	A26, A27, A28	Adjust for maximum output.
14.	Repeat steps 12 and 13.							

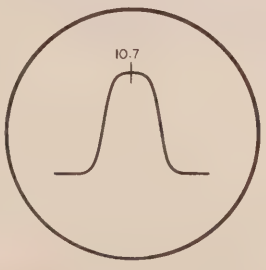


FIG. 1

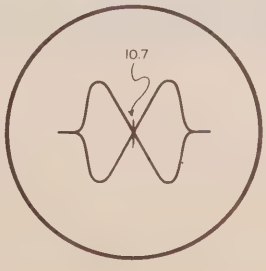
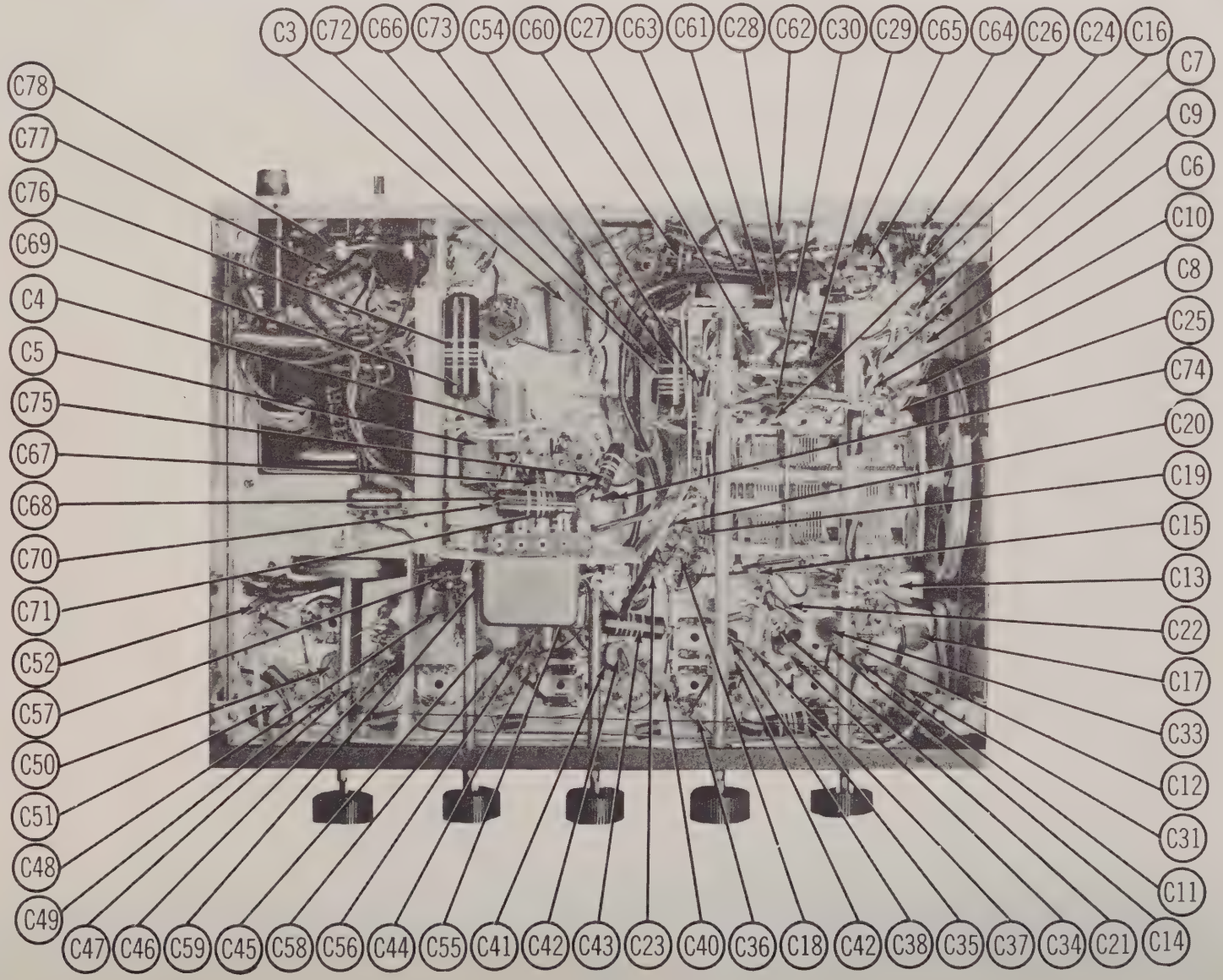
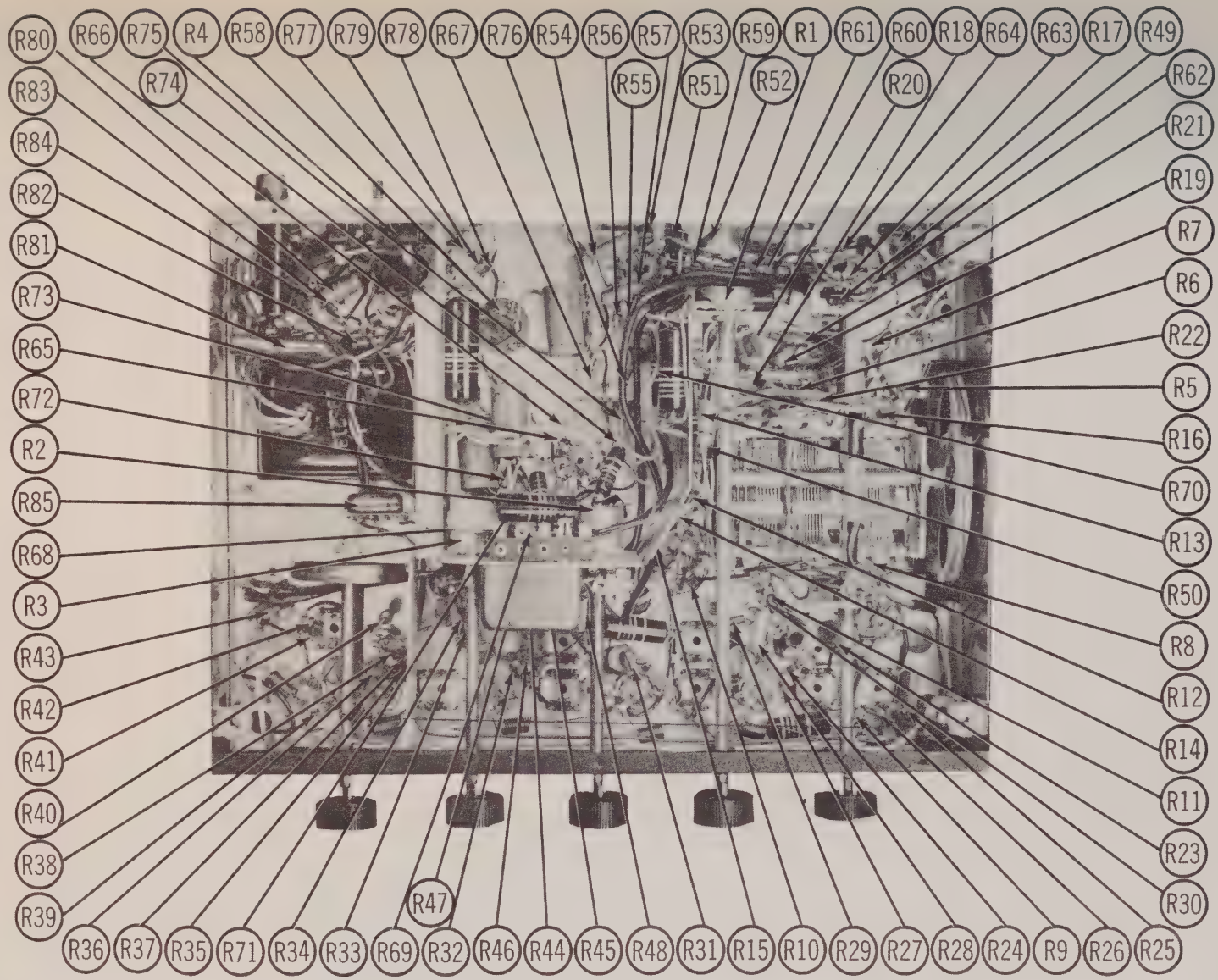


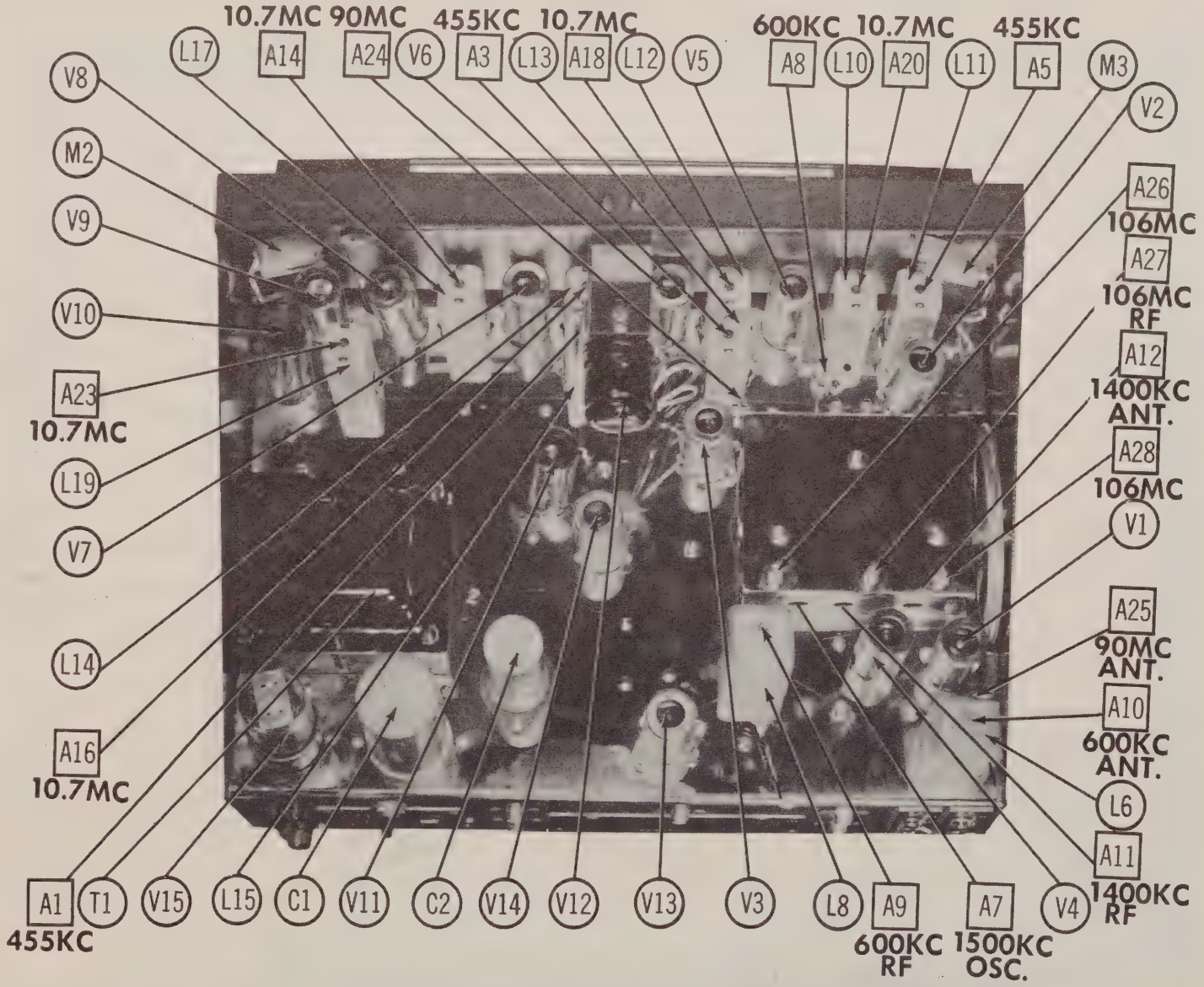
FIG. 2



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

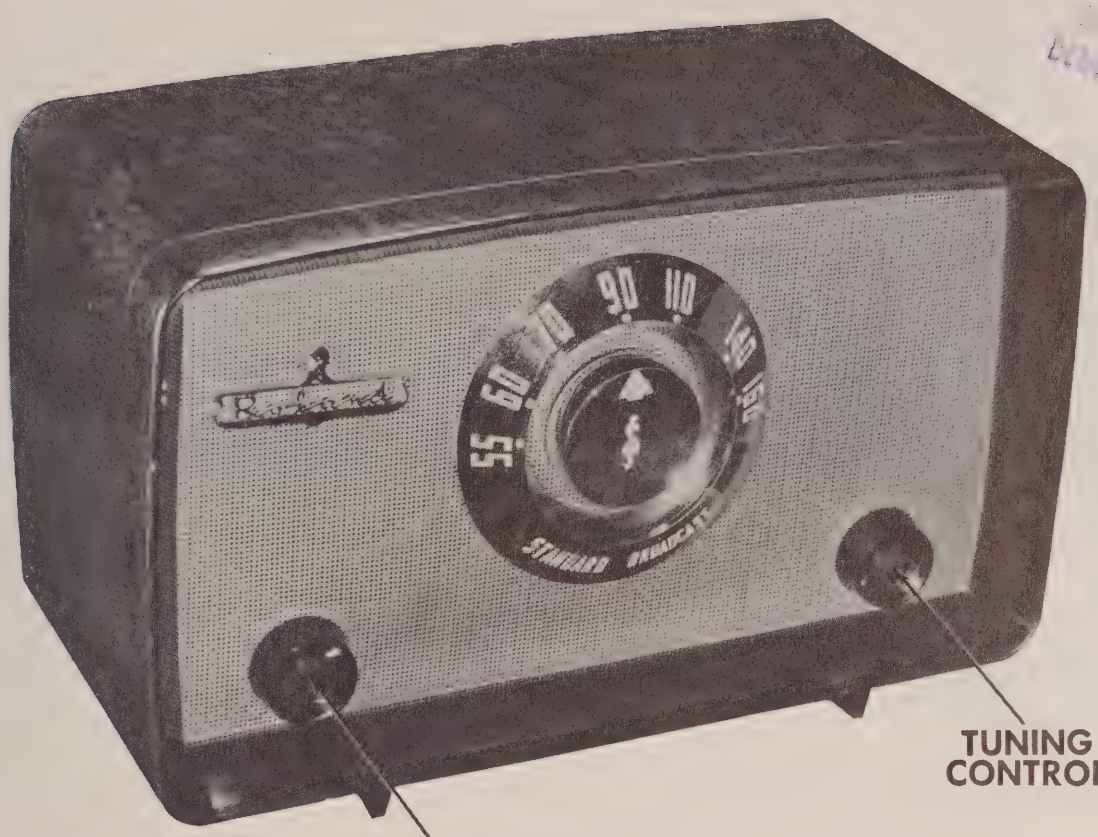


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS TOP VIEW

ROLAND
MODEL 5T2M



TUNING CONTROL

VOLUME CONTROL
ON-OFF SWITCH

ROLAND
MODEL 5T2M

TRADE NAME	Roland Model 5T2M
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, New York
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES(Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620 K C

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

Replace chassis in cabinet, turn tuning gang fully closed and set pointer parallel with base of cabinet at low frequency end of dial.

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PARTS LIST AND DESCRIPTIONS

ROLAND
MODEL 5T2M

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		ROLAND PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150		PRS150/40-30-20		EDL44215		3N532	TVA-3448	Red
B	40	150								Blue
C	20	150								Yellow
C2	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	220	500		1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C4	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C5	220	500		1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C6	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT-611	6TM-S1	
C7	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT-611	6TM-S1	
C8	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT-611	6TM-S1	
C9	.1	400		P488-1		PTE4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	VC-50	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

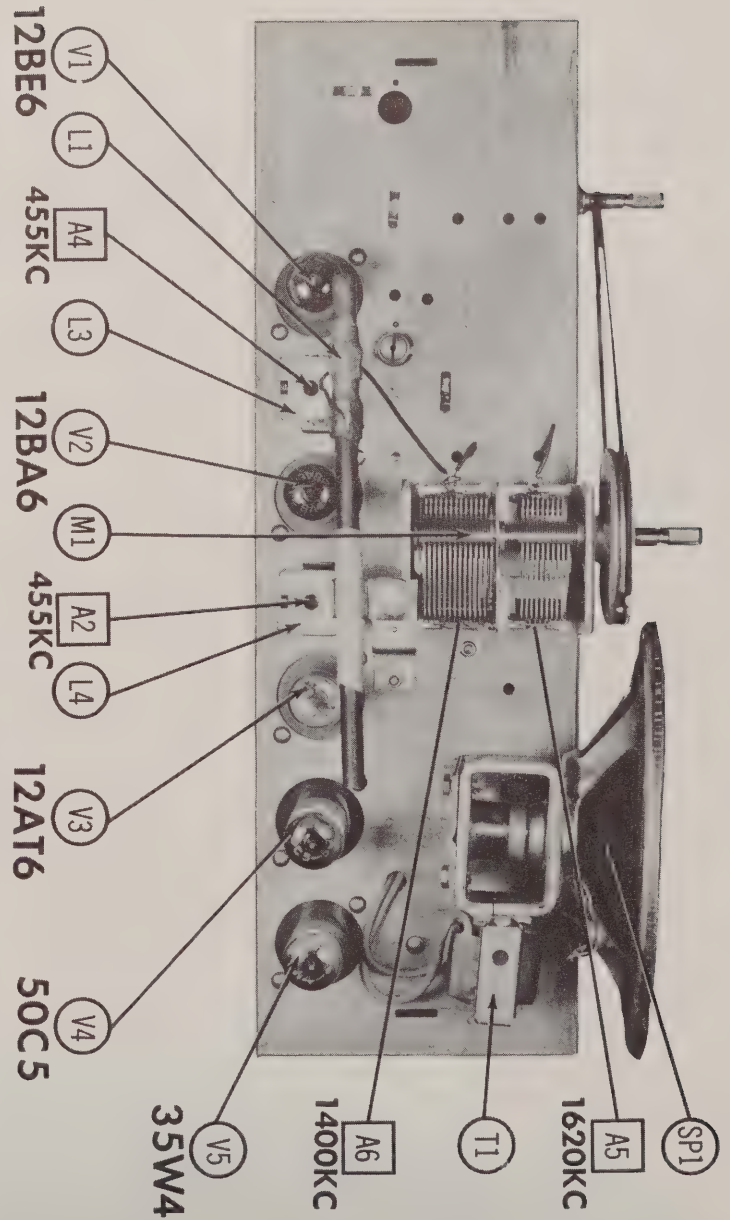
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	220Ω	½		BTS-220	
R4	2.2Meg	½		BTS-2.2Meg	
R5	4.7Meg	½		BTS-4.7Meg	
R6	220KΩ	½		BTS-220K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R7	470KΩ	½		BTS-470K	
R8	150Ω	1		BTA-150	
R9	330Ω	1		BTA-330	
R10	2200Ω	1		BTA-2200	
R11	18Ω	½			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ROLAND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.6KΩ	3.4Ω	238Ω	.86Ω		A-3332 ①	A-3025 ①	RO-2 ①	S-1X ①	①Bend mtg. tabs down file out slots, mount on original mtg. bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

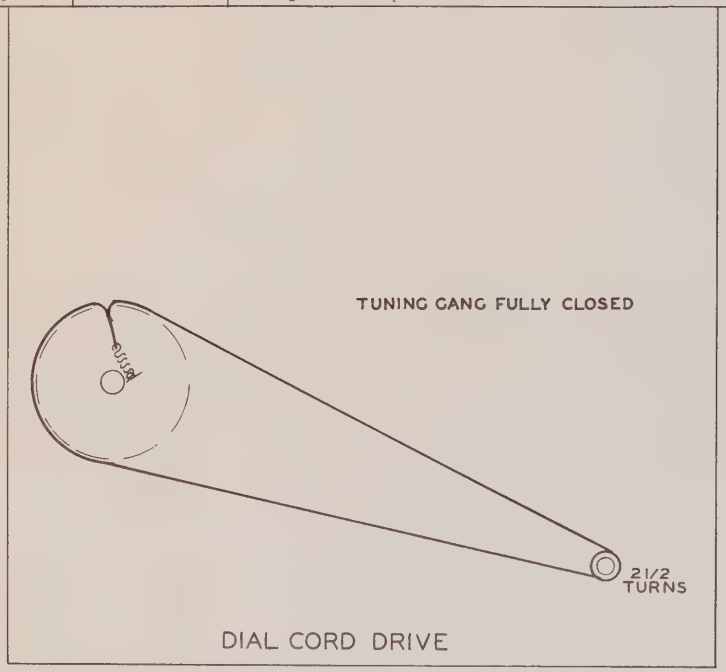
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.4Ω		ST-105 Mod. P5-X	5A07	

COILS (RF-IF)

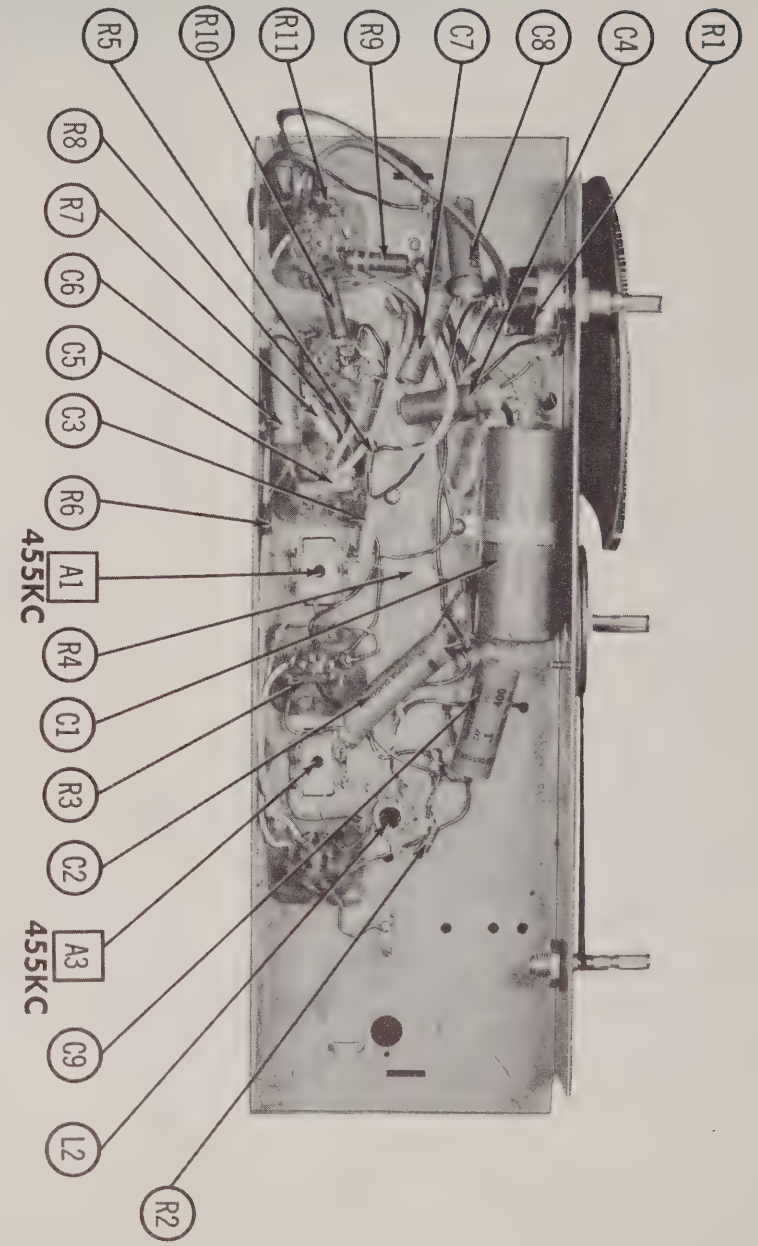
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	ROLAND PART No.	MILLER PART No.	MEISSNER PART No.	
L1	Loop Ant.	.7Ω				14-1073	
L2	Osc. Coil	.4Ω	6Ω			16-6758	
L3	Input IF	21Ω	21Ω		12 -C1	16-6758	
L4	Output IF	21Ω	21Ω		12-C2		

MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M1	Tuning Capacitor		2 Gang-37-459MMF, 25-185MMF

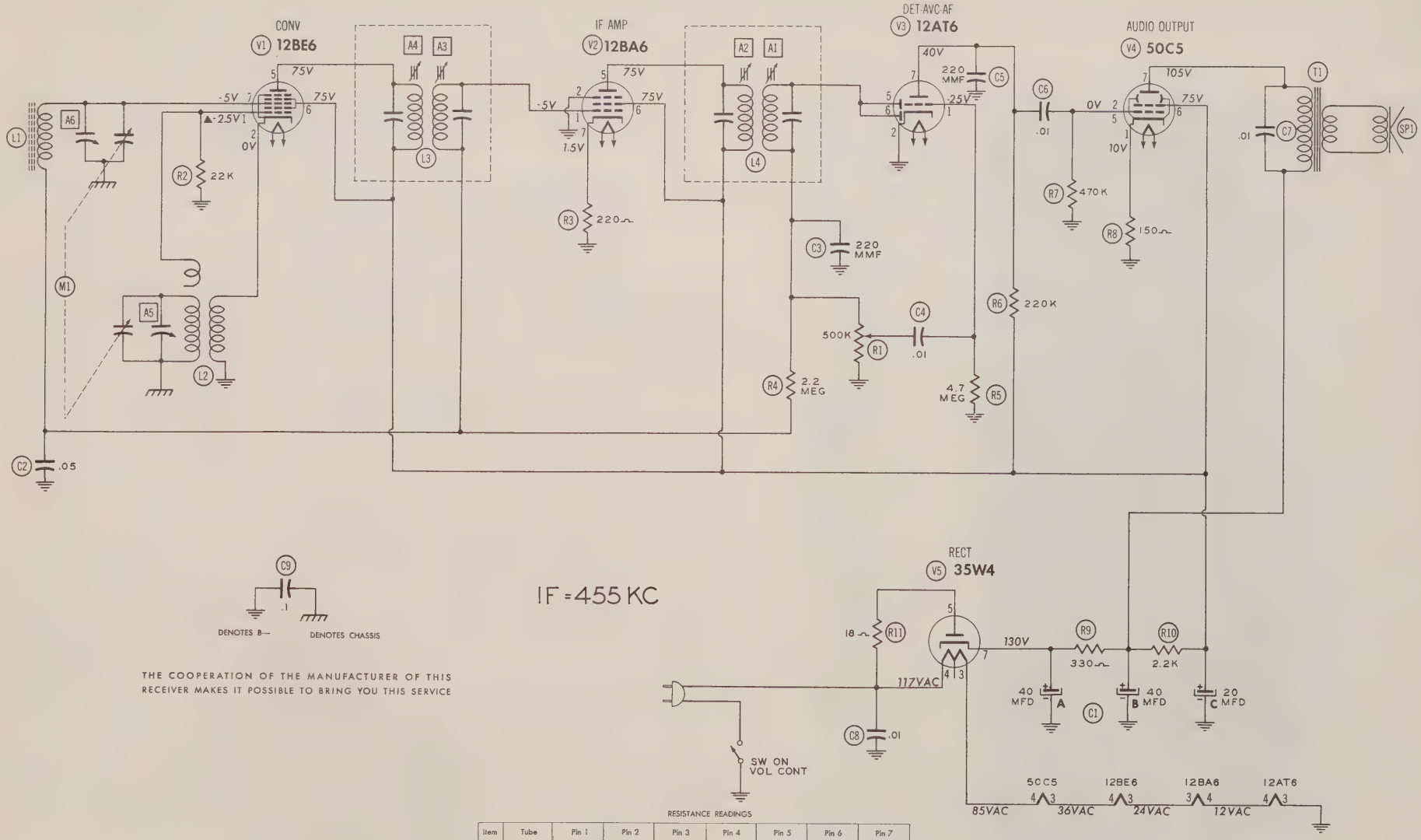


CHASSIS—BOTTOM VIEW



ROLAND MODEL 5T2M

ROLAND MODEL 5T2M



IF = 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	0Ω	24Ω	36Ω	†2.5KΩ	†2.5KΩ	2.7 Meg.
V 2	12BA6	2.7Meg	0Ω	24Ω	12Ω	†2.5KΩ	†2.5KΩ	220Ω
V 3	12AT6	4.7Meg	0Ω	0Ω	12Ω	500KΩ	500KΩ	†220KΩ
V 4	50C5	160Ω	470KΩ	36Ω	80Ω	470KΩ	†2.5KΩ	†560Ω
V 5	35W4	†330Ω	INF	80Ω	115Ω	125Ω	130Ω	38KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

TRUETONE
MODEL D2214A

TRUETONE
MODEL D2214A

TRADE NAME	Truetone Model D2214A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 (or) 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC/DC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.	"	Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

After alignment replace chassis in cabinet, turn tuning gang fully closed and set pointer approximately 1/4 inch above cabinet molding at low frequency end of dial.

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PARTS LIST AND DESCRIPTIONS

TRUETONE
MODEL D2214A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3A	Det. -AVC-AF Amp.	12AV6	12AV6	7BT	
B	Det. -AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	8C-17391	PRS150/50-30		EDL5315		2N520	TVA-2450	Blue Red
B	30	150								
C2	05	200	8D-10770	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3A	220									
B	005									
C	005		♦201-19303		♦PC-151		♦1408-02		♦103C5	
D	250									
E										
C4	02	400	8D-10774	P288-04	DF-203	PTE4S2		PT412	4TM-S2	
C5	047	400	8J-16081	489ZX-05		PJ4S47		PT4147	4TM-S47	
C6	09	400	8D-11251							

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B, R5C are combined in one unit.
When replacing items separately, C3D and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	A-10A-19788	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R2	47KΩ	½	9B1-82	BTS-47K	Note 1
R3	120Ω	½		BTS-120	
R4	3.3Meg	½	9B1-34	BTS-3.3Meg	
R5A	6.8Meg	½	♦201-19303	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	

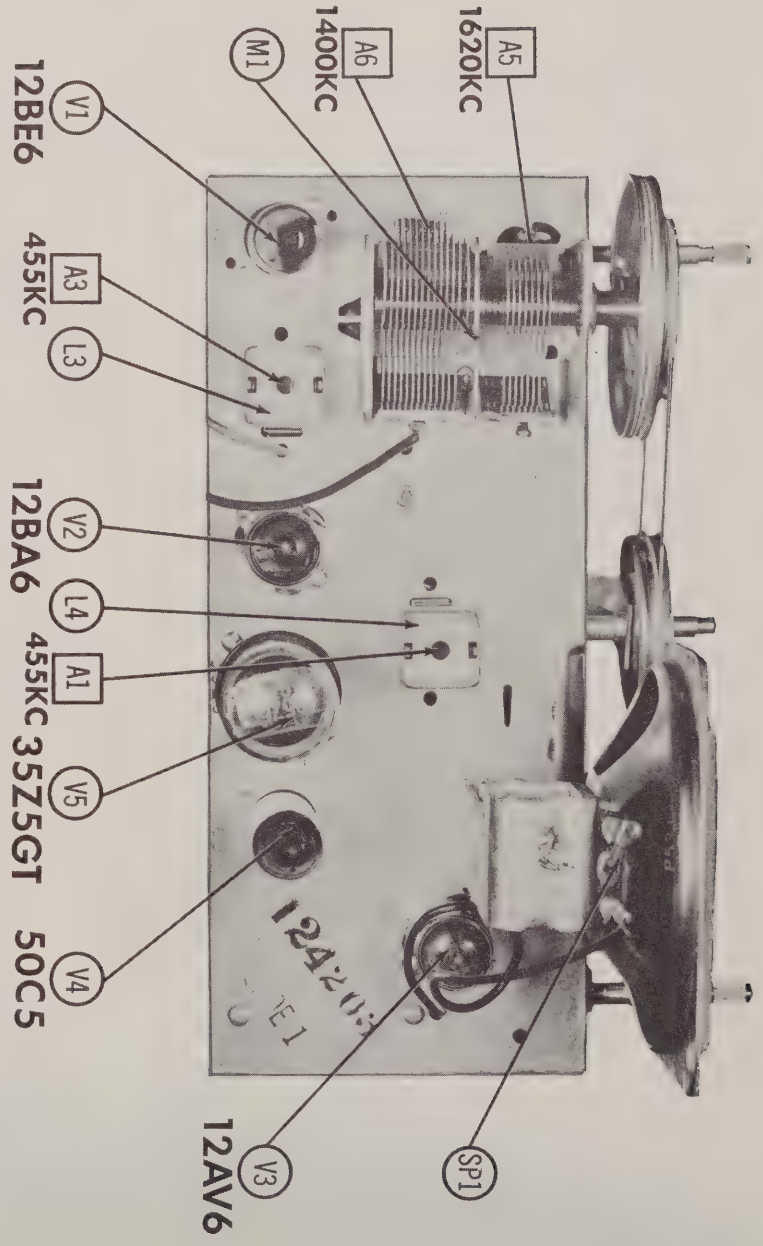
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R6	150Ω	½	9B1-52	BTS-150	Note 2
R7	1000Ω	1	9B2-62	BTA-1000	
R8	27Ω	½	9B1-43		
R9	270KΩ	½	9B1-27	BTS-220K	

Note 1. Some Models may use a 220Ω resistor in this application.
Note 2. For alternate application see schematic.
♦ Items R5A, R5B, R5C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.18KΩ	3.2Ω	165Ω	.52Ω	12C-17595-1	A-3332	A-3025	RO-2 ①	S-2X ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

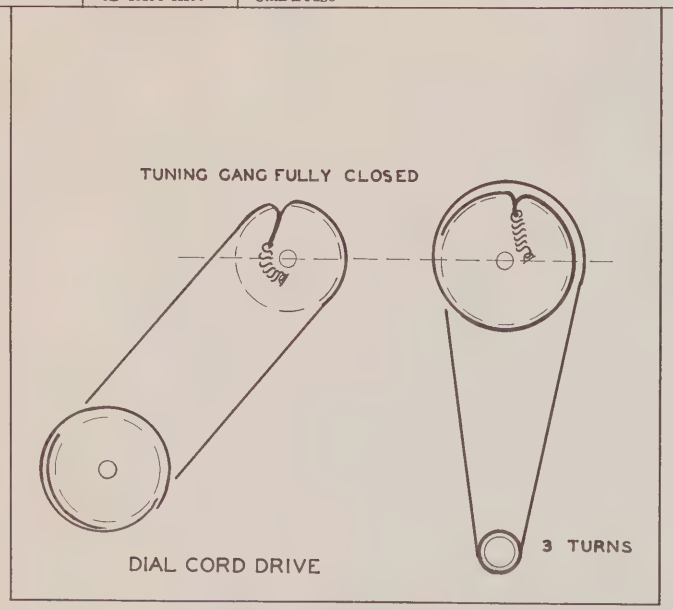
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	18A-19554	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

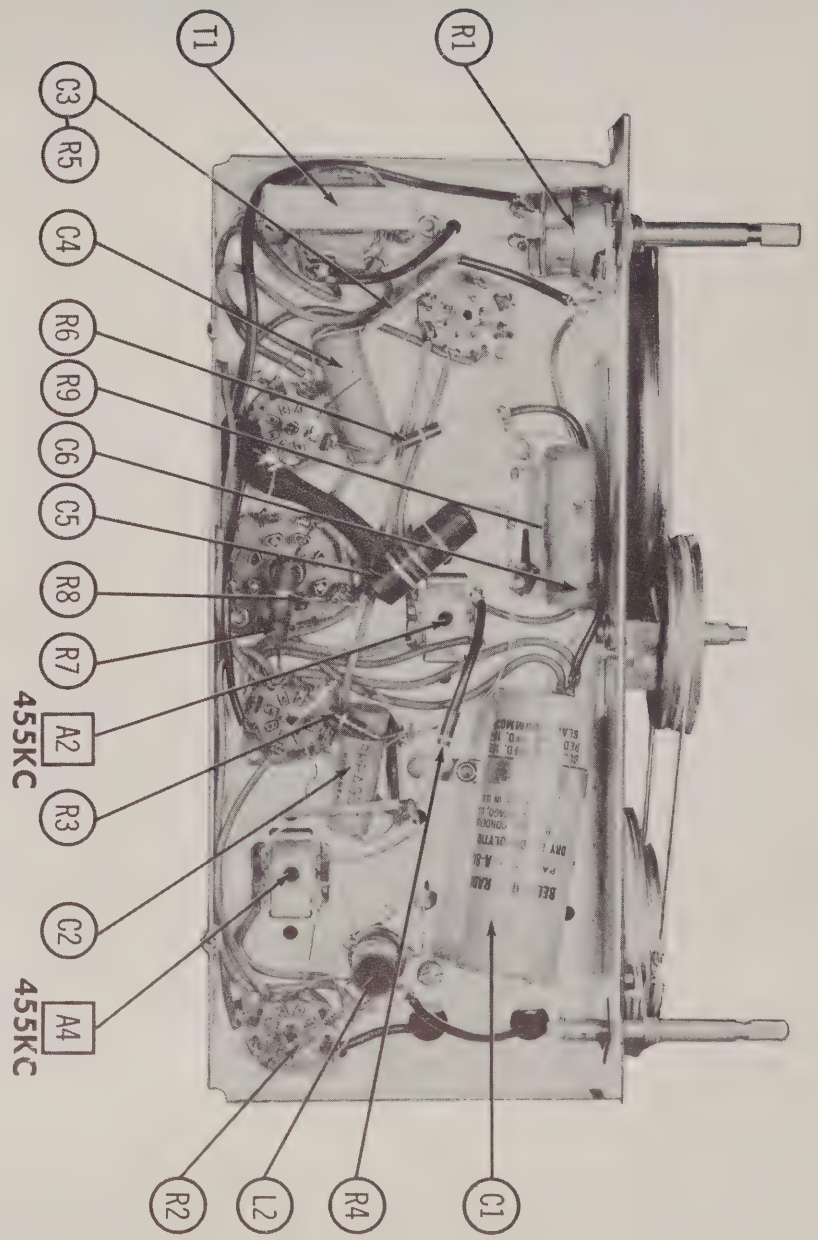
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	TRUETONE PART No.	MILLER PART No.	MEISSNER PART No.	
L1	Loop Ant.	0Ω	3Ω	13E-19560-1			
L2	Osc. Coil	.8Ω	6Ω	13D-17583			
L3	Input IF	14Ω	14Ω	13B-17731	12-C1	16-6758	
L4	Output IF	14Ω	14Ω	13B-17731	12-C2	16-6758	

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	Tuning Capacitor	8A-20219	31-429MMF, 22-150MMF
	Cabinet	5C-19530-A89	Red
	Cabinet	5C-19530-A109	Blue
	Cabinet	5C-19530-A110	Yellow
	Cabinet	5C-19530-A100	Chartreuse
	Pointer	2G-19559	
	Knob	5B-18164-A89	Red
	Knob	5B-18164-A109	Blue
	Knob	5B-18164-A110	Yellow
	Knob	5B-18164-A100	Chartreuse

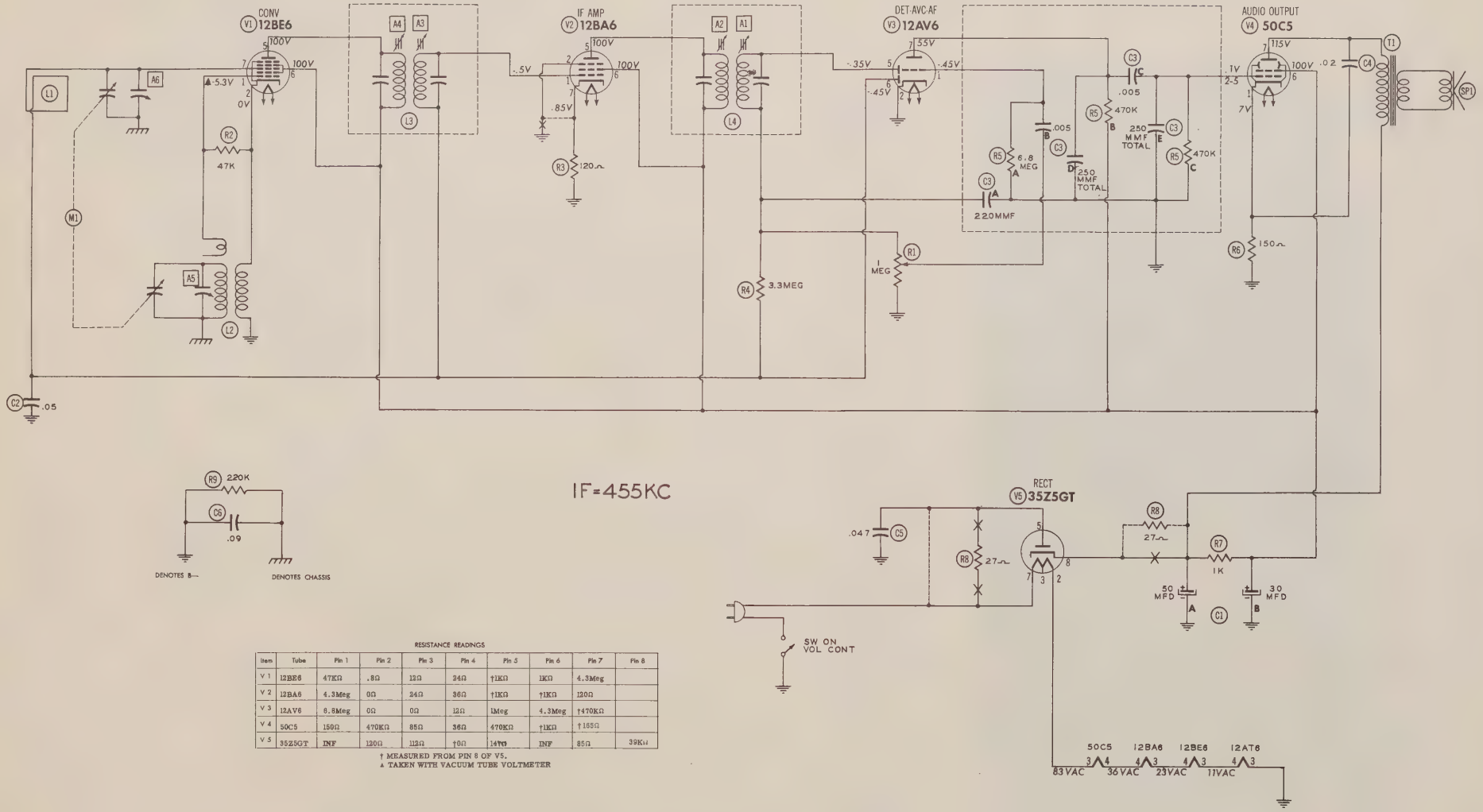


CHASSIS—BOTTOM VIEW



TRUETONE MODEL D2214A

TRUETONE MODEL D2214A



IF=455KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BE6	47KΩ	.8Ω	12Ω	24Ω	†1KΩ	1KΩ	4.3Meg	
V 2	12BA6	4.3Meg	0Ω	24Ω	36Ω	†1KΩ	†1KΩ	120Ω	
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	1Meg	4.3Meg	†470KΩ	
V 4	50C5	150Ω	470KΩ	85Ω	36Ω	470KΩ	†1KΩ	†165Ω	
V 5	35Z5GT	INF	120Ω	112Ω	†0Ω	14Ω	INF	85Ω	39KΩ

† MEASURED FROM PIN 8 OF V5.
▲ TAKEN WITH VACUUM TUBE VOLTMETER

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

RTMA MEMBER RADIO-TELEVISION MANUFACTURERS ASSOCIATION

TRUETONE MODELS 2D1315A, 2D1325A, 2D2312A, 2D2314A, 2D2321A

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MODEL 2D2312A

TRUETONE MODELS 2D1315A, 2D1325A, 2D2312A, 2D2314A, 2D2321A

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DATE 5-53 SET 204 FOLDER 11

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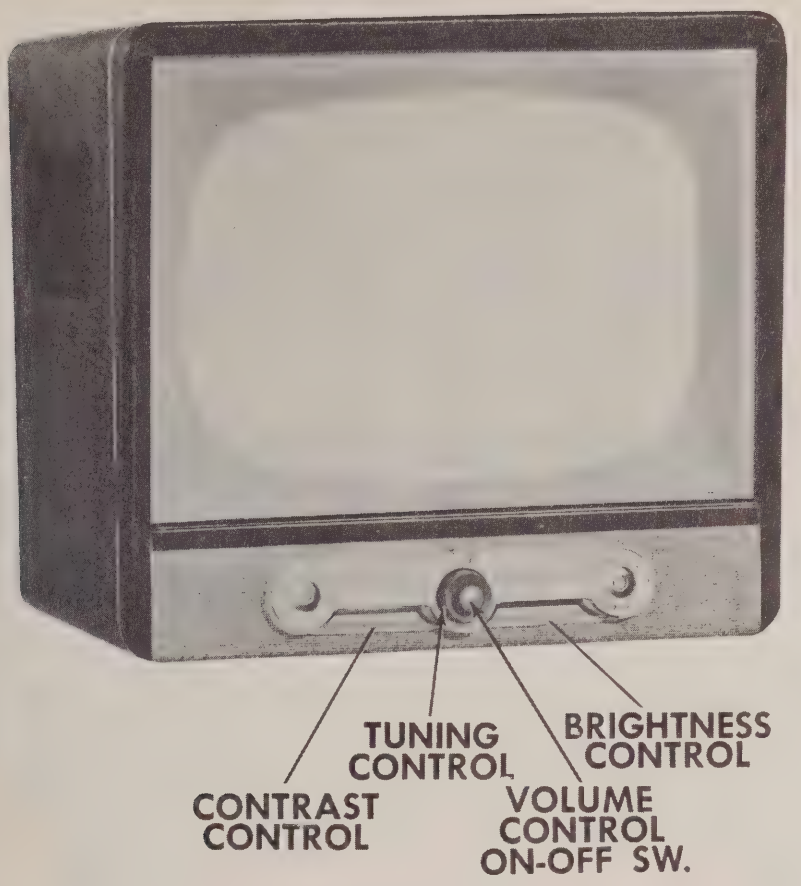

TRUETONE MODELS 2D1315A, 2D1325A, 2D2312A, 2D2314A, 2D2321A

TRUETONE MODEL 2D2312A

TRADE NAME	Truetone Models 2D1315A, 2D1325A (Ch. 21T1A) 2D2312A (Ch. 17T1B) 2D2314A, 2D2321A (Ch. 21T1A)
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-115 Volts AC-60 Cycle RATING 1.58 Amp. @ 115 Volts AC
TUNING RANGE	Channels 2 thru 13 (Continuous Tuning) Video IF 26.75 MC, Sound IF 22.25 MC (Intercarrier)

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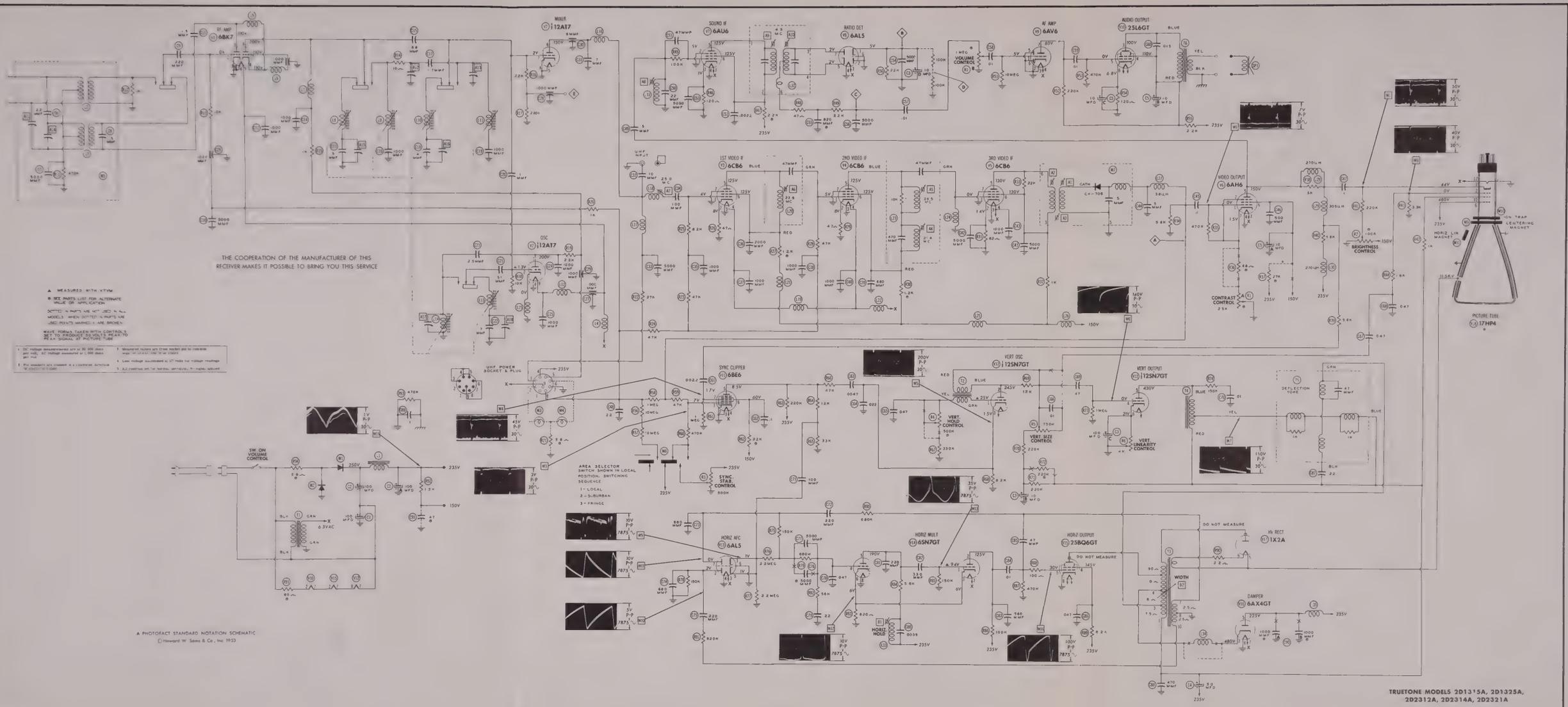
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A MEASURED WITH VTVM
B SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED 'H' PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED 'H' PARTS ARE USED POINTS MARKED + ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements are at 30,000 ohms per volt, AC voltage measured at 1,000 ohms per volt
2 Pin numbers are shown in a clockwise direction
3 Measured values are from socket pin to cathode except where otherwise noted
4 Line voltage measured at 117 volts for voltage readings
5 All controls set for normal operation, fringe signal
RF AMP 6BK7
MIXER 12AT7
OSC 12AT7
SOUND IF 6AU6
RATIO DET 6AL5
AF AMP 6AV6
AUDIO OUTPUT 25L6GT
VOLUME CONTROL
1ST VIDEO IF 6CB6
2ND VIDEO IF 6CB6
3RD VIDEO IF 6CB6
VIDEO OUTPUT 6AH6
CONTRAST CONTROL
BRIGHTNESS CONTROL
PICTURE TUBE 17HP4
ION TRAP CENTERING MAGNET
HORIZ. LIN. MAGNET
UHF POWER SOCKET & PLUG
SYNC CLIPPER 6BE6
SYNC. STAB. CONTROL
AREA SELECTOR SWITCH SHOWN IN LOCAL POSITION. SWITCHING SEQUENCE
1 - LOCAL
2 - SUBURBAN
3 - FRINGE
VERT OSC 12SN7GT
VERT. HOLD CONTROL
VERT SIZE CONTROL
VERT LINEARITY CONTROL
VERT OUTPUT 12SN7GT
HORIZ AFC 6AL5
HORIZ MULT 6SN7GT
HORIZ OUTPUT 25BQ6GT
HORIZ HOLD
DO NOT MEASURE
WIDTH
HV RECT 1X2A
DAMPER 6AX4GT
SW. ON VOLUME CONTROL
6.3VAC
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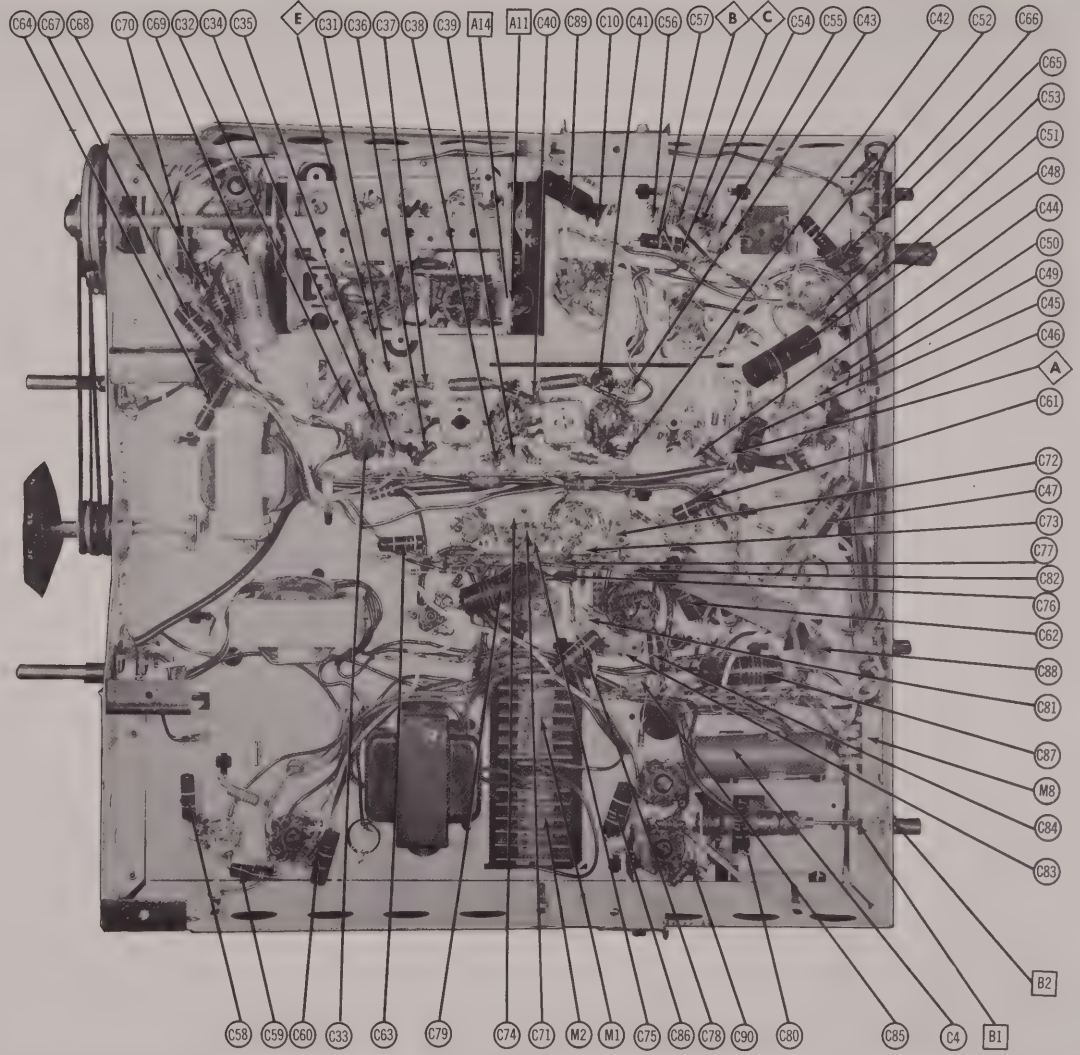
TRUETONE MODELS 2D13 15A, 2D1325A, 2D2312A, 2D2314A, 2D2321A

TRUETONE MODELS 2D1315A, 2D1325A, 2D2312A, 2D2314A, 2D2321A

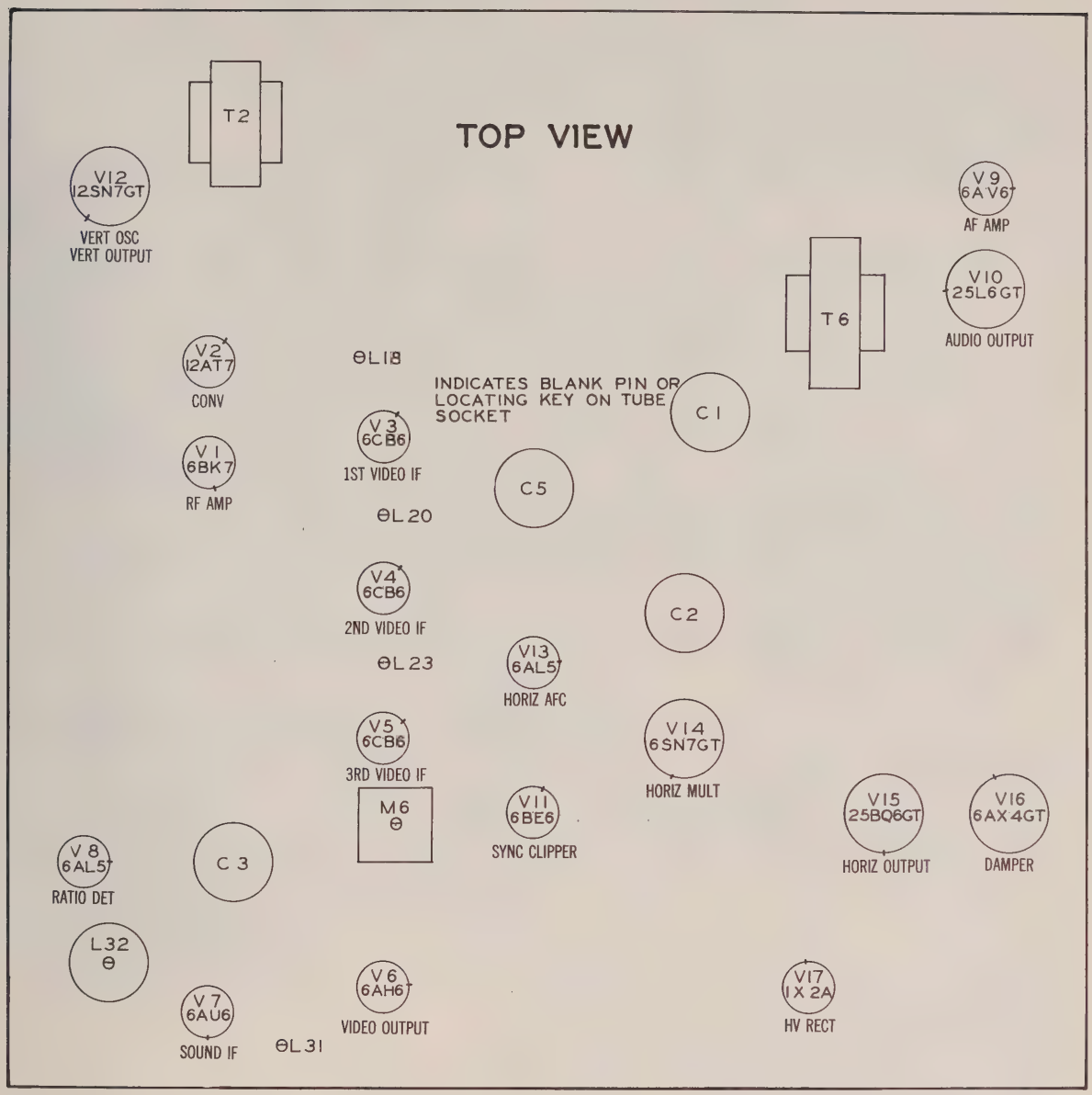
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

DENVER, COLORADO

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-Selenium Rectifiers (M1, M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster- V2, V3, V4, V5
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V6, V8
Has pic, no sound-V7, V8, V9, V10

SYNC FAILURE
No vert. sync.-V11, V12
No horiz. sync.-V11, V13, V14
No vert. or horiz. sync.-V11

SWEEP FAILURE
No raster, has sound-V14, V15, V16, V17, V18
No vertical deflection-V12
Poor vert. linearity or foldover-V12
Poor horiz. linearity or foldover-V14, V15, V16
Narrow picture-V14, V15, V16, V17, M1 & M2
Vert. off freq.-V12
Horiz. off freq.-V13, V14

NOTE: SINCE THIS RECEIVER EMPLOYS TUBES USED IN A SERIES-PARALLEL FILAMENT NETWORK, AN OPEN FILAMENT IN ANY TUBE IN SERIES MAY CAUSE THE SET TO BE INOPERATIVE.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Set "Finge-Suburban'Local" switch to "Fringe" position.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	25MC (10MC Swp)	23.5MC 26.2MC	13	Vert. amp to point (A). Low side to chassis.	A1, A2, A3	Connect a short between pin 5 and 6 of V4. Adjust generator for 1 Volt peak on scope. Adjust A1, A2 and A3 for response as in fig. 1. A3 is an adjustable coupling rod underneath the chassis.
2.	"	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	Not used.	21.4MC	"	Use VTVM. DC probe to point (A). Common to chassis.	A4	Remove the short maintain 2 volt reading at VTVM. Adjust A4 for maximum deflection.
3.	"	"	"	26.5MC	"	"	A5	Adjust for maximum deflection.
4.	"	"	"	21.4MC	"	"	A4	"
5.	"	"	"	23.8MC	"	"	A6	"
6.	"	"	"	25.0MC	"	"	A7	"
7.	"	"	25MC (10MC Swp)	23.5MC 26.5MC	"	Vert. amp to point (A). Low side to chassis.	A1	Adjust A1 for flat top response curve as in fig. 2. If response is not shown in fig. 2 repeat the alignment procedure.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the fine tuning until sound bars just appear in the picture.
Starting from extreme counter clockwise position adjust A8 in clockwise direction for minimum sound indication in picture. Do not adjust for maximum sound from speaker.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.
Short the antenna terminals to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A9	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point (C) Common to point (D)	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Short the antenna terminals to chassis.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point (B). Low side to chassis.	A9	Disconnect stabilizer capacitor C3D. Adjust for curve of maximum amplitude and symmetry as in fig. 3.
9.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A10	Reconnect capacitor C3D. Adjust so that 4.5MC occurs at center of crossover lines as in fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

TUNER ALIGNMENT

Preset the trimmer screws as shown in fig. 5.
Turn the tuner to the top of its stroke in low band position.
Adjust coil cores so that bottoms of cores are 1.6 inch above bottoms of coil forms.
Connect a .001MFD capacitor across scope input terminals and 10KΩ in series with hot lead of scope.

LOW BAND RF ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	6	Vert. Amp. to point (E). Low side to chassis.	A11, A12, A13	Adjust for maximum response as in fig. 6.
11.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for response similar to fig. 6. If necessary retouch A12 and A13 for nearest approach to fig. 6 response on all all low band channels.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

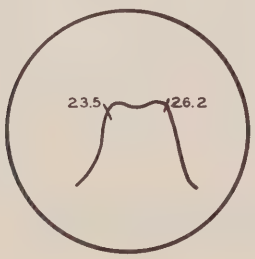


FIG.1

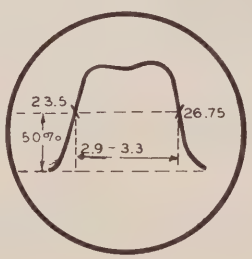


FIG.2

FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

HIGH BAND RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. to point (E). Low side to chassis.	A14, A15 A16	Adjust for maximum response as in fig. 6.
13.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for response similar to fig. 6. If necessary retouch A15 and A16 for nearest approach to fig. 6 response on all high band channels.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characeristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC Swp)	83.25MC	6	Vert. amp to point (A). Low side to chassis.	A17	Adjust to place video marker at 50% on low frequency slope of response as in fig. 7.
15.	"	"	69MC (10MC Swp)	67.25MC	4	"		Check for marker placement as in fig. 7. If necessary make slignt compromise adjustments of A17 for best marker placement across low band channels.
			57MC (10MC Swp)	55.25MC	2			
16.	"	"	213MC (10MC Swp)	211.25MC	13	"	A18	Adjust to place video marker at 50% on low frequency slope of response as in fig. 7.
17.	"	"	195MC (10MC Swp)	193.25MC	10	"		Check for marker placement as in fig. 7. If necessary make slight compromise adjustment of A18 for best marker placement across high band channels.
			177MC (10MC Swp)	175.25MC	7			

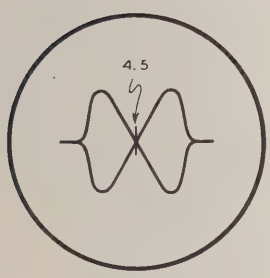


FIG. 4

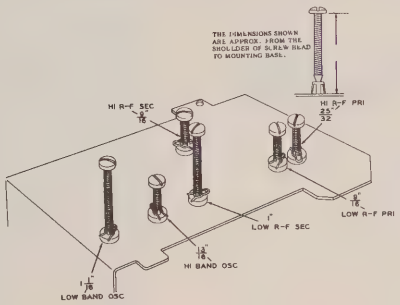


FIG. 5

FIG. 6

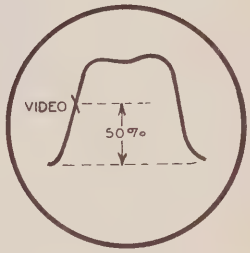


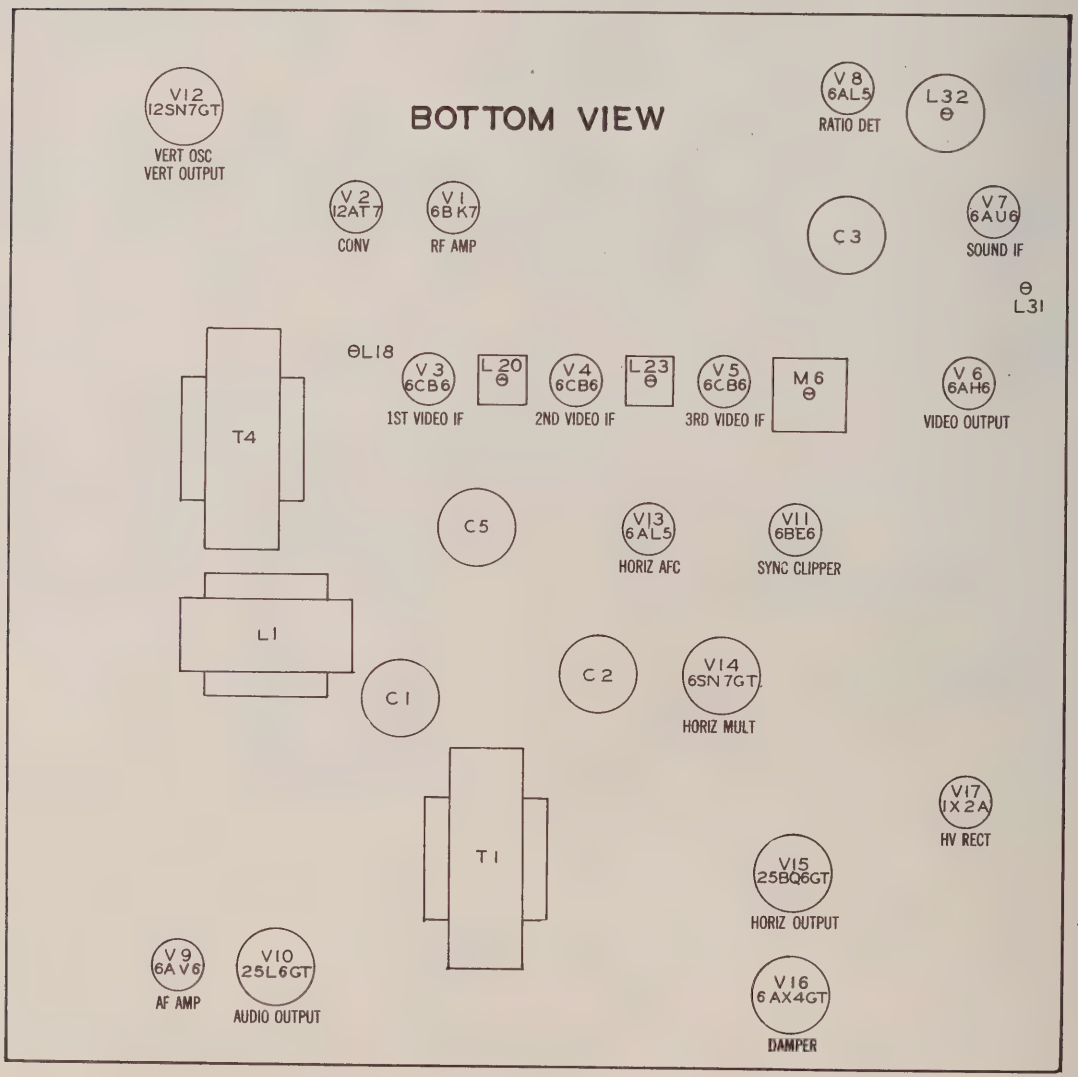
FIG. 7

TRUETONE MODELS 2D1315A, 2D1325A, 2D2312A, 2D2314A, 2D2321A

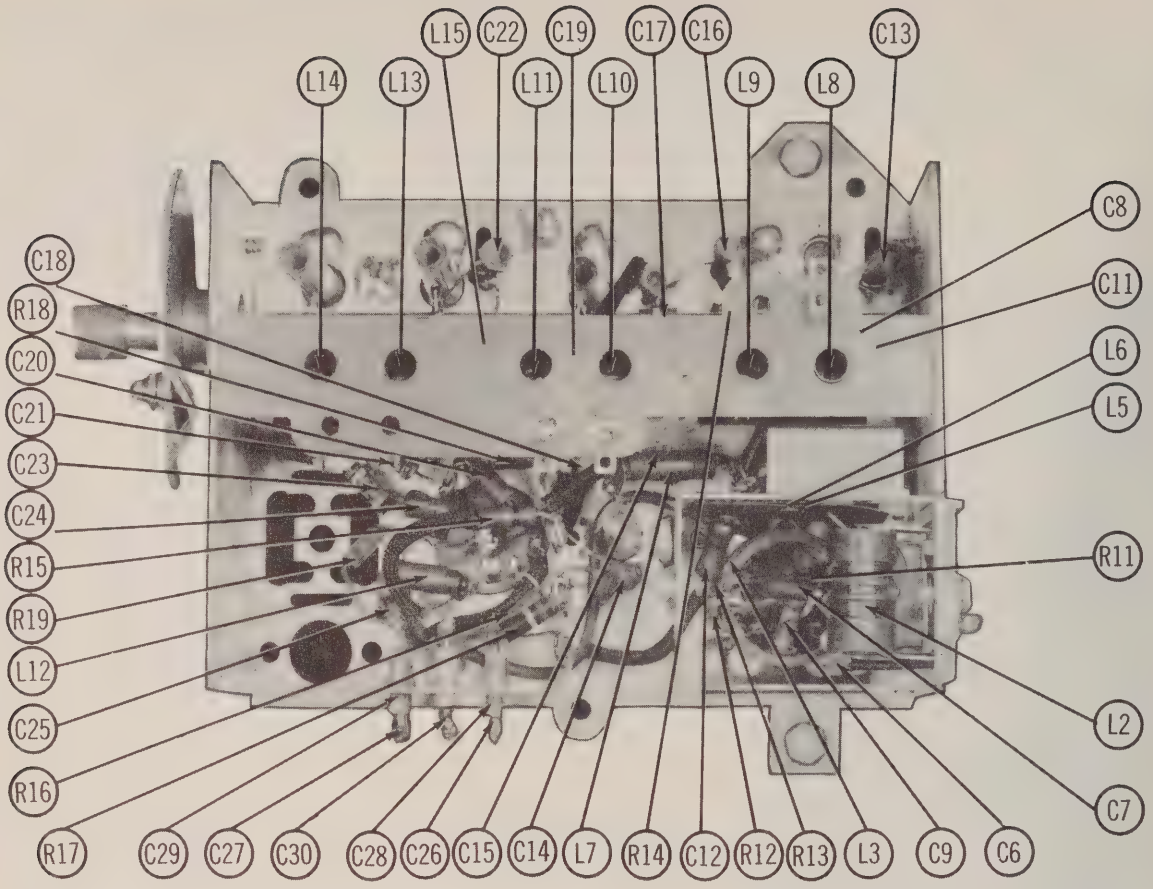
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	1 Meg	0Ω	0Ω	.1Ω	†1.1KΩ	INF	INF	0Ω
V 2	12AT7	†2.3KΩ	10KΩ	2Ω	0Ω	0Ω	†27KΩ	242KΩ	0Ω	.1Ω
V 3	6CB6	1.1Meg	47Ω	0Ω	.1Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 4	6CB6	1.1Meg	47Ω	0Ω	.1Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 5	6CB6	2Ω	82Ω	0Ω	.1Ω	†2.6KΩ	†2.6KΩ	0Ω		
V 6	6AH6	470K	140Ω	.1Ω	0Ω	†5.6KΩ	†1.6KΩ	140Ω		
V 7	6AU6	100KΩ	0Ω	.1Ω	0Ω	†3.7KΩ	†3.7KΩ	120Ω		
V 8	6AL5	22KΩ	0Ω	.1Ω	0Ω	INF	0Ω	INF		
V 9	6AV6	10 Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†220KΩ		
V 10	25L6GT	INF	■32Ω	†2.4KΩ	†2.2KΩ	470KΩ	INF	■24Ω	120Ω	
V 11	6BE6	53KΩ	0Ω	0Ω	.1Ω	45KΩ	†24KΩ	1 Meg		
V 12	12SN7GT	660KΩ	#1Meg	8.2KΩ	1 Meg	#1.1KΩ	2KΩ	■7Ω	■15Ω	
V 13	6AL5	2.2Meg	150KΩ	.1Ω	0Ω	2.2Meg	0Ω	4.5Meg		
V 14	6SN7GT	150KΩ	†100KΩ	820Ω	5 Meg	†5.6KΩ	820Ω	.1Ω	0Ω	
V 15	25BQ6GT	INF	■24Ω	INF	†8.2KΩ	470KΩ	INF	■15KΩ	0Ω	Top Cap #12Ω
V 16	6AX4GT	INF	5 Meg	5Meg	INF	†72Ω	44KΩ	.1Ω	0Ω	
V 17	1X2A	PINS 1 - 9 HAVE INF RESISTANCE								Top Cap # 200Ω
V 18	17HP4	0Ω	3.3KΩ	Pin 6 †71Ω	Pin 10 #1KΩ	Pin 11 250KΩ	Pin 12 .1Ω			

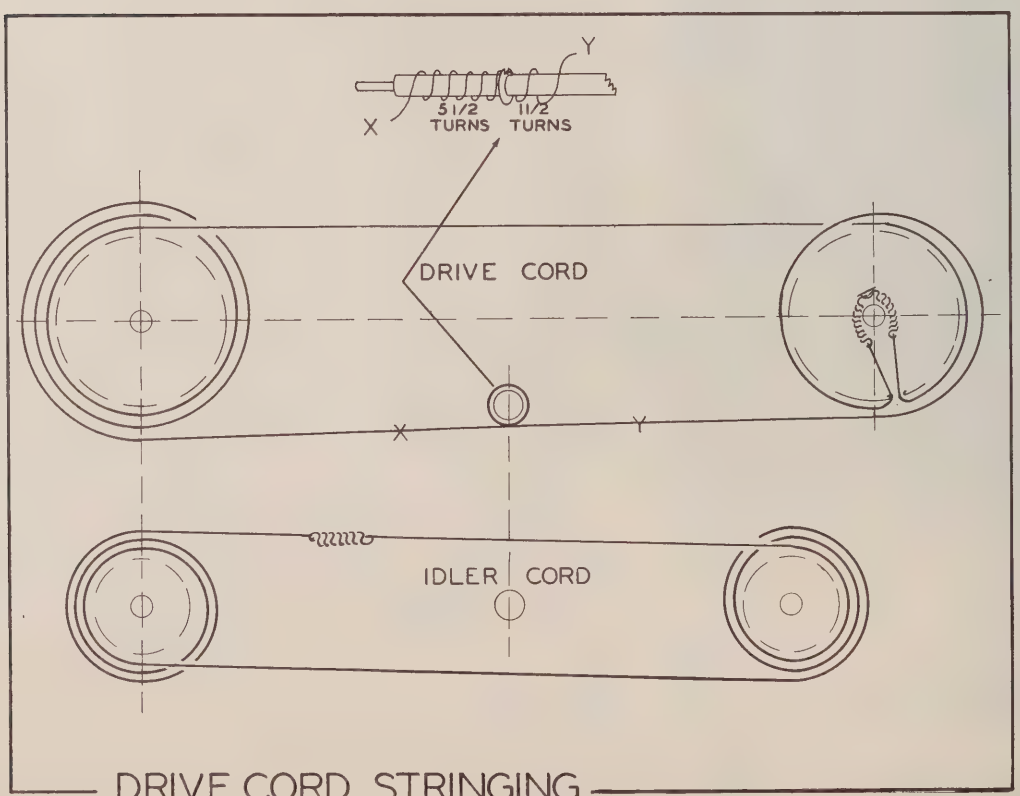
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED.
AREA SELECTOR SWITCH IN LOCAL POSITION
† MEASURED FROM OUTPUT OF M1
# MEASURED FROM PIN 3 OF V16
■ MEASURED FROM OFF-ON SWITCH



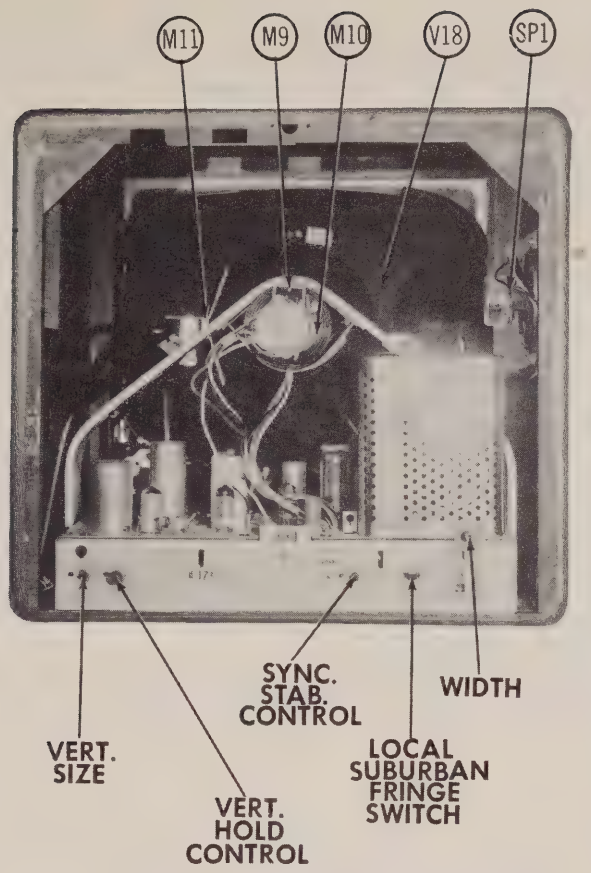
TUBE PLACEMENT CHART



RF-TUNER



DRIVE CORD STRINGING



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the contrast control for normal contrast.

Turn the horizontal hold thumb screw clockwise until it reaches its stop, then counter clockwise 2 full turns. The thumb screw is a vermier adjustment and should then be in the center of its range.

Adjust the horizontal hold slug (B1) until the picture synchronizes horizontally and make any further adjustment of B1 necessary to set it to the middle of its range of synchronization.

Adjust the width slug (B2) for picture slightly wider than necessary to fill the picture mask horizontally. Adjustment of B2 may affect the vertical size slightly.

HORIZONTAL LINEARITY MAGNET

Adjust the position of the horizontal linearity magnet (found near the neck of the picture tube) for best linearity at the right hand side of the picture.

SYNC STABILIZER CONTROL

The sync stabilizer control should be adjusted to the position which results in the most stable synchronization.

DISASSEMBLY INSTRUCTIONS

① Remove 4 push on type control knobs from front panel.

② Remove 2 screws. Remove antenna bracket front rear cover.

③ Remove 4 wood screws. Remove rear cover.

④ Disconnect speaker. Remove 2 speaker nuts. Remove speaker.

⑤ Remove 6 chassis bolts. Remove chassis.

NOTE: FOR PICTURE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6BK7	6BK7	9AJ	
V2	Converter	12AT7	12AT7	9A	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp	6CB6	6CB6	7CM	
V5	3rd Video IF Amp	6CB6	6CB6	7CM	
V6	Video Output	6AH6	6AH6	7BK	
V7	Sound IF Amp	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AF Amplifier	6AV6	6AV6	7BT	
V10	Audio Output	25L6GT	25L6GT	7AC	
V11	Sync Clipper	6BE6	6BE6	7CH	
V12	Vert. Oscillator-Vert. Output	12BN7GT	12BN7GT	8BD	
V13	Horiz. AFC	6AL5	6AL5	6BT	
V14	Horiz. Mult.	6BN7GT	6BN7GT	8BD	
V15	Horiz. Output	25BQ6GT	25BQ6GT	6AM	
V16	Damper	6AX4GT	6AX4GT	4CG	
V17	HV Rectifier	1X2A	1X2A	1AV	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V16A	17HP4	17HP4	12C	① Circuit Changes necessary.
		17HP4	12C	
B	21FP4A	21FP4A	12C	
		21FP4 ①	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	100	150	8C-20684	AFHI-21		UPE10015			FPU6	TVL-1535
C2	100	150	8C-20709	AFHI-21		UPE10015			FPU6	TVL-1535
C3A	▲100	300	8C-20808	AFH4-110						TVL-4638
B	▲10	400		LPRS25/100						
C	100	25								
D	▲10	75								
C4	50	300	8C-21274	PR9450/40		BR8045			TC88	TVA-1613
C5A	▲10	300	8C-20954	AFB3-124		UPU1135			FP330.5	TVL-3580
B	▲10	300								
C	10	15								
C6	22		8G-11892		TCN-32		N750K-220			5TCU-Q22
C7	5000		8G-13962	BPD-005	DD-502	TM5D5	81L-005		DC-525	5HK-D5
C8	1.5		8G-12495-8	SU.5MP0	TCZ-1.5		NP0K-1R5		Z7S415	5TCCB-V15
C9	220		8G-18045	SU220	D8-221		GP2K-221		UC-5323	5GA-T22
C10	5000		8G-13962	BPD-005	DD-502	TM5D5	81L-005		DC-525	5HK-D5
C11	1.5		8G-12495-8	SU.5MP0	TCZ-1.5		NP0K-1R5		Z7-5515	5TCCB-V15
C12	1000		8G-13201	SU000	D8-102	TM5D1	GP2L-102		UC-521	5HK-D1
C13	15		8G-13017	SU15NP0	TCZ-15		NP0K-150		Z7-5415	5TCCeQ15
C14	1000		8G-13201	SU000	D8-102	TM5D1	GP2L-102		UC-521	5HK-D1
C15	8		8G-12495-1		TCZ-.68		NP0K-R68			
C16	1000		8G-13201	SU000	D8-102	TM5D1	GP2L-102		UC-521	5HK-D1
C17	1.7		8G-12495-8							
C18	4		8G-19314				NP0K-040			
C19	1000		8G-13201	SU000	D8-102	TM5D1	GP2L-102		UC-521	5HK-D1
C20	1		8G-12495-2		TCZ-1		NP0K-010			5TCCB-V1
C21	51		8G-11891		TCN-51		N750L-510			
C22	7		8G-15224				N750K-070			
C23	10		8G-11789	SU0NP0	TCZ-10		NP0K-100		Z7-541	5TCC-Q1
C33	3000		8G-13962	BPD-005	DD-502	TM5D5	81L-005		DC-525	5HK-D5
C34	100	500	8F3-8	1469-0001	D8-101	5W5T1	GP1K-101		MC335	1FM-31
C35	1000		8G-13201	SU000	D8-102	TM5D1	GP2L-102		UC-521	5HK-D1
C36	2000		8G-19522	SI2000	D8-202	TM5D2	GP2-333-202		UC-522	5HK-D2
C37	1000		8G-13201	SU000	D8-102	TM5D1	GP2L-102		UC-521	5HK-D1
C38	1000		8G-13201	SU000	D8-102	TM5D1	GP2L-102		UC-521	5HK-D1
C39	680	500	8G-21105	SI680	D8-681		GP2K-681		UC-5368	5GA-T68
C40	1000		8G-13201	SU000	D8-102	TM5D1	GP2L-102		UC-521	5HK-D1
C41	5000		8G-13962	BPD-005	DD-502	TM5D5	81L-005		DC-525	5HK-D5
C42	5000		8G-13962	BPD-005	DD-502	TM5D5	81L-005		DC-525	5HK-D5
C43	1000		8G-13201	SU000	D8-102	TM5D1	GP2L-102		UC-521	5HK-D1
C44	5		8G-12186	SU5NP0	TCZ-4.7		NP0K-050		Z7-555	5TCCB-V47
C45	.1	200	8J-18085	P288-1	DP-104	P2Z P1			PT401	2TM-P1
C46	5000		8G-13962	BPD-005	DD-502	TM5D5	81L-005		DC-525	5HK-D5
C47	.1	400	8J-18063	P488-1	DP-104	PTE4P1			PT401	4TM-P1
C48	.22	200	8J-18082	P488-22		PTE4P22			PT4025	2TM-P22
C49	5		8G-12186	SU5NP0	TCZ-4.7		NP0K-050		Z7-555	5TCCB-V47
C50	22		8G-13909	SU22NP0	TCZ-22		NP0K-220			5TCC-Q22
C51	47		8G-12198	SI47	D8-470	5W5G5	GP1K-470	UC-5447		5GA-Q47
C52	.0022	400	8J-20634	P688-0022	D8-222	PTE6D22	GP2-333-222		PT6322	6TM-D22
C53	5000		8G-13962	BPD-005	DD-502	TM5D5	81L-005		DC-525	5HK-D5
C54	5000		8G-13962	BPD-005	DD-502	TM5D5	81L-005		DC-525	5HK-D5
C55	820	500								Note 1
C56	5000		8G-21207	BPD-005	DD-502	TM5D5	81L-005		DC-525	5HK-D5
C57	.01	400	8J-18084	P488-01	D8-103	PTE4S1	GP2-333-103		PT411	4TM-S1
C58	.01	400	8J-18084	P488-01	D8-103	PTE4S1	GP2-333-103		PT411	4TM-S1
C59	.01	400	8J-18084	P488-01	D8-103	PTE4S1	GP2-333-103		PT411	4TM-S1
C60	.015	400	8J-20594	P488-015		PTE6S15			TP400	6TM-S15
C61	.0022	400	8J-20590	P688-0022	D8-222	PTE6D22	GP2-333-222		PT6322	6TM-D22
C62	.1	400	8J-18083	P488-1	DP-104	PTE4P1			PT401	4TM-P1
C63	.0047	400	8J-20592	P688-0047	D8-472	PTE6D47	GP2-333-472		PT6347	6TM-D47
C64	.022	200	8J-18086	P488-022	DP-203	PTE4S22			PT4122	4TM-S22
C65	.047	200	8J-18096	P288-047	DP-503	PTE4S47			PT4147	2TM-S47

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C66	.01	400	8J-18084	P488-01	D8-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C67	.047	400	8J-18081	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C68	.047	200	8J-18096	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C69	.47	400	8J-21505	484-5		P24P5		PT405	4TM-P5	
C70	.01	600	8J-18097	P688-01	D8-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C71	100	500	8F3-113	1469-0001	D8-101	5W5T1	GP1K-101	MC335	1FM-31	
C72	220	500	8F3-117	1469-00025		5R5T25		MCB240	MS-325	
C73	680	500	8F3-123	1469-0007		2R5T7			MS-37	
C74	680	500	8F3-123	1469-0007		2R5T7			MS-37	
C75	220	500	8F3-117	1469-00025		5R5T25		MCB240	MS-325	
C76	5000		8G-13962	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	Note 2
C77	5000		8G-13962	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C78	.047	200	8J-18096	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C79	.22	200	8J-18082	P488-22		PTE4P22		PT4025	2TM-P22	
C80	.0039	600	8J-20613	1464-004		1DR5D4		MCB463	MS-24	
C81	220	500	8F3-117	1469-00025		5R5T25		MCB240	MS-325	
C82	330	500	8F3-119	1469-00035					MS-37	
C83	560	500	8F3-122						MS-37	
C84	.01	400	8J-18084	P488-01	D8-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C85	47		8G-12198	SI47	D8-470		GP1K-470	UC-5447	5GA-Q47	
C86	.047	400	8J-18081	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C87	.22	200	8J-18082	P488-22		PTE4P22		PT4025	2TM-P22	
C88	470	1000	8G-21440					MCK347		
C89	.1	400	8J-18083	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C90A	1000			BPD-2X001	DD-2-103	TM5DD1	81Z-001	DCD-521	5HK-2D1	Note 2
B	1000									Note 2
C91	.47	600	8J-21505	684-5		P36P5		PT605	TC-5	Note 2

Note 1. Some Models use 560MMF in this application (Part #8F3-122)
Note 2. Not used in all Models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2500Ω	½	10A-20856				UF252L	Contrast-Panel - Note 1
B	1 Meg	½					UR18A	Volume-Rear - Note 1
C	Switch						US-26	Attach to R1a
R2A	100KΩ	½	10B-21204	Q11-128	AG-49-S	B-40	U-41	Brightness - Note 1
B	Shaft	½	Not Req.	Not Req.	AG-58-S	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	10B-20558	Q11-133	AG-58-S	AB-59	SU-50	Sync Stability
B	Shaft	½	Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	100KΩ	½	10B-20558	Q11-133	AG-58-S	AB-59	SU-50	Vert. Hold - Note 1
B	Shaft	½	Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	750KΩ	½	10B-19230	Q11-136	AG-61-S	AB-89	U-85	Vert. Size
B	Shaft	½	Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6	4000Ω	1	10B-21062					Vert. Linearity-Wire Wound - 1000Ω Stop
R7	2500Ω	½	10B-21476					Contrast- Note 2
R8	100KΩ	½	10B-17275					Brightness- Note 2
R9	1 Meg	½	10A-21484					Volume & Switch- Note 2
R10	500KΩ	½	10B-21456					Vert. Hold- Note 2

Note 1, Used on Ch. 17T1A
Note 2. Used on Ch. 21T1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	NOTES
R11	470KΩ	½	9B1-29		
R12	1000Ω	½	9B1-62	BTS-1000	
R13	10KΩ	½	9B1-74	BTS-10K	
R14	10Ω	½	9B1-38		
R15	1000Ω	½	9B1-13	BTS-1000	
R16	22KΩ	½	9B1-78	BTS-22K	
R17	220KΩ	½	9B1-27		
R18	10KΩ	½	9B1-74	BTS-10K	
R19	2200Ω	½	9B1-66	BTS-2200	
R20	1000Ω	½	9B1-62	BTS-1000	
R21	5.6Ω	½	9C1-1072		Note 1
R22	2775Ω	½	9B2-79	BTA-27K	
R23	47KΩ	½	9B1-82	BTS-47K	
R24	47KΩ	½	9B1-82	BTS-47K	
R25	82000Ω	½	9B1-73		
R26	47Ω	½	9B1-46		
R27	12000Ω	½	9B1-13	BTS-1200	Note 7
R28	47KΩ	½	9B1-82		
R29	47Ω	½	9B1-46		
R30	12000Ω	½	9B1-13	BTS-1200	Note 7
R31	820Ω	½	9B1-49	BTS-82	
R32	1000Ω	½	9B1-13	BTS-1000	
R33	22KΩ	½	9B1-78		
R34	56000Ω-5%	½	9B1-71	BTS-5600-5%	
R35	470KΩ	½	9B1-94	BTS-470K	
R36	68Ω	½			Note 2
R37	27KΩ	½	9B2-79	BTA-27K	Note 2
R38	15KΩ	½	9B1-76	BTS-15K	
R39	5600Ω	½	9B1-71	BTS-5600	
R40	5600Ω	½	9B4-71	BTS-5600	
R41	220KΩ	½	9B1-90	BTS-220K	
R42	1000Ω	½	9B1-62	BTS-1000	
R43	3300Ω	½	9B1-68	BTS-3300	
R44	1800Ω	½	9B1-65	BTS-1800	
R45	100KΩ	½	9B1-86		
R46	120Ω	½	9B1-51	BTS-120	
R47	2200Ω	½		BTS-2200	Note 3
R48	47Ω	½	9B1-46		
R49	22KΩ	½	9B1-78	BTS-22K	
R50	22KΩ	½	9B1-78	BTS-22K	
R51	10 Meg	½	9B1-110	BTS-10 Meg	
R52	220KΩ	½	9B1-90	BTS-220K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	NOTES
R53	470KΩ	½	9B1-94	BTS-470K	
R54	120Ω	1	9B2-51	BTA-120	
R55	2200Ω	5	9C12-1103	1/3A-2250	
R56	10 Meg	½	9B1-110	BTS-10 Meg	
R57	10 Meg	½	9B1-110	BTS-10 Meg	
R58	1 Meg	½	9B1-98	BTS-1 Meg	
R59	47KΩ	½	9B1-82	BTS-47K	
R60	470KΩ	½	9B1-94	BTS-470K	
R61	1 Meg	½	9B1-98	BTS-1 Meg	
R62	22KΩ	5		1 3/4A-22K	Note 4
R63	220KΩ	½	9B1-90	BTS-220K	
R64	12KΩ	½	9B1-75	BTS-12K	
R65	33KΩ	½	9B1-80	BTS-33K	
R66	47KΩ	½	9B1-82	BTS-47K	
R67	330KΩ	½	9B1-92	BTS-330K	
R68	8200Ω	½	9B1-73	BTS-8200	
R69	12KΩ	½	9B1-75	BTS-12K	
R70	220KΩ	½	9B1-90	BTS-220K	
R71	220KΩ	½	9B1-90	BTS-220K	
R72	220KΩ	½	9B1-90	BTS-220K	Note 2
R73	1 Meg	½	9B1-98	BTS-1 Meg	
R74	150KΩ	½	9B1-88	BTS-150K	
R75	150KΩ	½	9B1-88	BTS-150K	
R76	2.2Meg	½	9B1-102	BTS-2.2Meg	
R77	2.2Meg	½	9B1-102	BTS-2.2Meg	
R78	150KΩ	½	9B1-88	BTS-150K	
R79	680KΩ	½	9B1096	BTS-680K	
R80	680KΩ	½	9B1-96	BTS-680K	
R81	820KΩ	½	9B1-97	BTS-820K	
R82	56KΩ	½	9B1-83	BTS-56K	
R83	820Ω	1	9B2-61	BTA-820	
R84	5600Ω	1	9B2-71	BTA-5600	
R85	150KΩ	½	9B1-88	BTS-150K	
R86	100KΩ	½	9B1-86	BTS-100K	
R87	470KΩ	½	9B1-94	BTS-470K	
R88	100Ω	50	9B4-50		
R89	8200Ω	2	9B4-73	BTB-8200	
R90	2.2Ω	½	9C1-1087		
R91	150Ω	20			Note 5
R92	1500Ω	10	9M20736	1 3/4A-1500	
R93	470KΩ	½	9B1-94	BTS-470K	
R94	5.6Ω	4	46M-20681		Note 6

Note 1. Not used in chassis no. 17T1A
Note 2. Not used in all models.
Note 3. Some models use a 8200Ω (2 Watt) resistor in this application.
Note 4. Some models use a 27KΩ (1 Watt) resistor in this application.
Note 5. Some models use a 175Ω (20 Watt) resistor in this application.
Note 6. Used as a fuse.
Note 7. Some models a 10000Ω resistor in this application

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No.
T1	117VAC	6.3VAC			12D21160			FO-66 ①	F-63 ①
	▲ .44A	▲ 5.1A							

① Drill one new mtg. hole.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	200Ω	110Ω	B12M-18241 B12M-18241-③	A-8125	A-3000 ②	TSO-1	A-97X	Vert. Osc. Trans. Horiz. Output Trans.
T3	215.5Ω Tap ▲	5Ω Tap ▲ 2.5Ω SEC. 2	C201-21025					
	15.5Ω, 25.5Ω	0Ω		A-3039	TSO-12	A-104X		
T4	10770 Tap ▲ 70		B12C20761-1	A-8141	A-3039	TSO-12	A-104X	Vert. Output Trans.
T5A	12Ω		C301-21130	DY-8 ④	MDF-70 ⑤	TY-2 ⑥	U-12 ④	Horiz. Deflection Coils
B	65Ω		C201-21514 ③					Vert. Deflection Coils

① Alternate vert. osc. trans.
② Drill one new mtg. hole.
③ Used on 21-inch receivers.
④ Use original deflection network

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES PRI.	RATING: DC RES SEC.	REPLACEMENT DATA: TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	2.3KΩ	3.15Ω	176Ω	.55Ω	12C21215	A-3876	A-2928	RO-2	S-1X	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	5"	PM	3.15Ω	18A-21218 18A-21442 ①	ST-105 (Mod P3-X)	5A07	① 10" PM Speaker

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (D. CURRENT 1000 ᵐA)	REPLACEMENT DATA: TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.270A	71Ω	2.92HY	18A21214	C-2326	2991 ①	TR-3300 ①	C-17X

① Drill one new mtg. hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: TRUETONE PART No.	MILLER PART No.	MEISSNER PART No.	IRC PART No	NOTES
L2	Ant. Trans.	0Ω	0Ω	13E-21189				Low Band
L3	Ant. Trans.	0Ω	0Ω	13E-20797				High Band
L4	Fil. Choke	.1Ω		16A-17937				
L5	Neutralizing Coil	0Ω		13M-20781				
L6	Cathode Choke	0Ω		13M-20780				
L7	RF Choke	1Ω		16A-17128				High Band
L8	RF Coil	0Ω		13E-17140				Low Band
L9	RF Coil	0Ω		13E-12046				
L10	Mixer Grid Coil	0Ω		13E-17140				High Band
L11	Mixer Grid Coil	0Ω		13E-12046				Low Band
L12	Fil. Choke	0Ω		16A-20777				
L13	Osc. Coil	0Ω		13E-17140				High Band
L14	Osc. Coil	0Ω		13D-12155				Low Band
L15	Cathode Choke	2Ω		20I-15608				
L16	RF Choke	0Ω		16A-21856	4602			1 Microhenery
L17	RF Choke	2Ω		20I-15608	4626			20 Microhenries
L18	Ist. Video IF	.1Ω		20I-20782	6188 ■		17-1003	
L19	Fil. Choke	.1Ω		16A-17937	6175			5.2 Microhenries
L20	2nd. Video IF	.1Ω		20I-21111				Includes 47MMF cap.
L21	RF Choke	1.8Ω		16A-18676	4606		CLA	2.2Microhenries
L22	Fil. Choke	.1Ω		16A-17937	6175			5.2 Microhenries
L23	3rd. Video IF	.1Ω		20I-21494				Includes 10KΩ resistor, 470 & 47MMF capacitors.
L24	Grid Choke	2Ω		20I-15608	4626			20 Microhenries
L25	RF Choke	1.8Ω		16A-18676	4606		CLA	2.2Microhenries
L26	RF Choke	2Ω		20I-15608	4626			20 Microhenries
L27	Series Peaking Coil	2.6Ω		20I-20265	6178		19-3036	38 Microhenries
L28	Series Peaking Coil	7.5Ω		16A-20970	6181		19-3250	270Microhenries
L29	Shunt Peaking Coil	8.5Ω		16A-21391	4585		19-1923	305 Microhenries
L30	Shunt Peaking Coil	7.5Ω		16A-20970	6181		19-3250	270 Microhenries
L31	Sound IF	1.4Ω		20I-21398	1470		20-1005	
L32	Ratio Det.	4.2Ω	.7DCT	13M-21644 *	6203 †		17-3493	Tertiary Windings. .25Ω
L33	Horiz. Osc.	85Ω		20I-20291	6210■		19-1578■	
L34	Cathode Choke	2Ω		20I-15608	4626			Not used in all models— 20 Microhenries
L35	RF Choke	2Ω		20I-15608	4626			20 Microhenries

■ Enlarge mounting holes.
* Alternate part #13M-19643.
† Use adaptor plate.

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

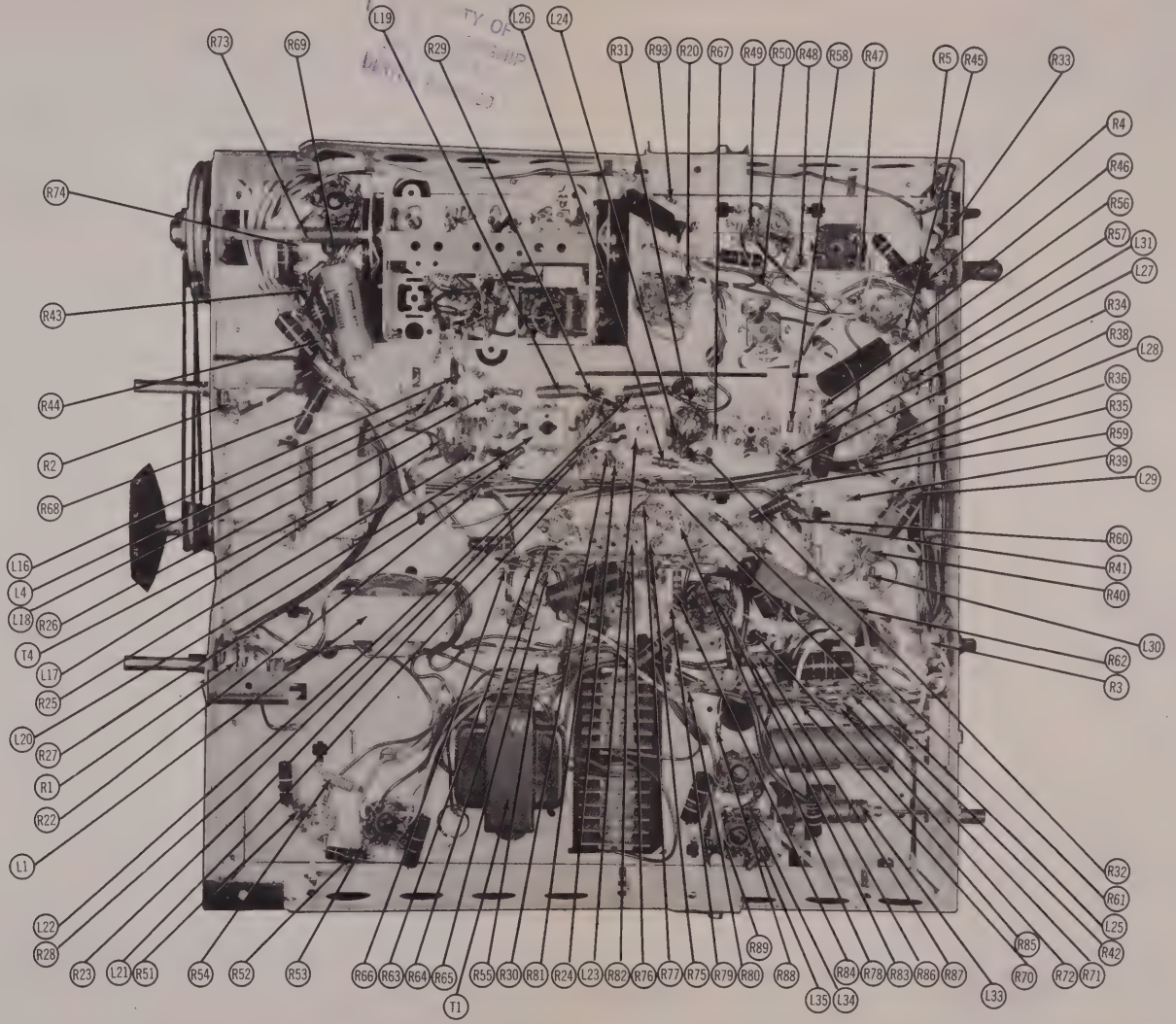
ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	TRUETONE PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.270A	21J20097	NH5	6Q4	1090	6S300	300
M2	.270A	21J20097	NH5	6Q4	1090	6S300	300

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					TRUETONE PART No.		
M3	Bayonet	6-8	.15	Brown	46A-10793		Type #47 } Used in 21"
M4	Bayonet	6-8	.15	Brown	46A-10793		Type #47 } Models only

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M5	Antenna Trans. Assy.	201-21192	
M6	RF Tuner		
M7	4th. Video IF		
	Crystal		CK-706 } Video Detector Assembly
	Capacitor	8G-12166	5MMF 500V. } Part #13B-21167
	Peaking Coil	201-15608	
M8	Switch	20B-21506	Area Selector (Fringe - Suburban - Local)
M9	Centering Magnet	16M-20697	
M10	Ion Trap	16M-19906	
M11	Magnet	16M-21526	Horiz. Linearity (17" Models only)
M12	Magnet	16M-21499	Anti-Pin Cushion Correction (21" Models only)
	Knob	5B-21423A-103	Off/On Volume (Model 2D-2312A) .
	Knob	5B-21422A-103	Tuning (Model 2D-2312A).
	Knob	5B-21423A-76	Off/On Volume (Model 2D-2321A, 2D-1315A).
	Knob	5B-21422A-76	Tuning (Model 2D-2321A, 2D-1315A).
	Knob	5B-21423-92	Off/On Volume (Model 2D-2314A).
	Knob	5B-21422-92	Tuning (Model 2D-2314A).
	Knob	5B-21423-56	Off/On Volume (Model 2D-1325A).
	Knob	5B-21422A-56	Tuning (Model 2D-1325A).
	Knob	5B-21393-29	Star Type (2 Used).
	Knob	5B-18382-36	Antenna
	Rear Cover	200-21438	17" Models only .
	Rear Cover	200-21578	21" Models only.
	Safety Glass	30M-20725	17" Models only.
	Safety Glass	30M-21458	21" Models only.
	Cabinet	24D-21564	Model 2D-2312A
	Cabinet	24D-21566	Model 2D-2321A
	Cabinet	24D-21565	Model 2D-2314A
	Cabinet	24D-21567	Model 2D-1315A
	Cabinet	24D-21653	Model 2D-1325A
	Mask	25M-21482A-101	Model 2D-2312A
	Mask	25M-21579A-101	Model 2D-2321A
	Mask	25M-21579A-106	Model 2D-2314A, 2D-1325A
	Mask	25M-21579A-103	Model 2D-1315A



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

WEBCOR
MODELS B-123-1, F-123-1

WEBCOR
MODELS B-123-1, F-123-1

TRADE NAME	Webcor Models B-123-1, F-123-1
MANUFACTURER	Webster-Chicago, 5610 Bloomingdale Ave., Chicago 39, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12SQ7 AF Amp., 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .22 Amp. @ 117Volts AC

RECORD CHANGER UNIT- WEBSTER-CHICAGO MODEL 121

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

WEBCOR
MODEL B-123-1

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		WEBCOR PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	12SQ7	12SQ7	8Q	
V2	Audio Output	50L6GT	50L6GT	7S	
V3	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	WEBCOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150		PRS150/50-30-20		EDL44215		3N532	TVA-3448	Red
B	40	150								Red
C	20	150								Blue
C2	10	25		PRS25/10		BR102A		TC22	TVA-1204	
C3	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C4	.015	400		P488-015		PTE6S15		TP400	6TM-S15	
C5	.015	400		P488-015		PTE6S15		TP400	6TM-S15	
C6	.0022	600		P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C7	.0022	600		P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C8	.047	400		489ZX-05		PJ4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBCOR PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	31P052	Q13-137	AG-63-Z	BSK-70	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
R2A	1Meg	½	31P017	Q13-137	AG-63-Z	BSK-70-S	U-53	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R2A

RESISTORS

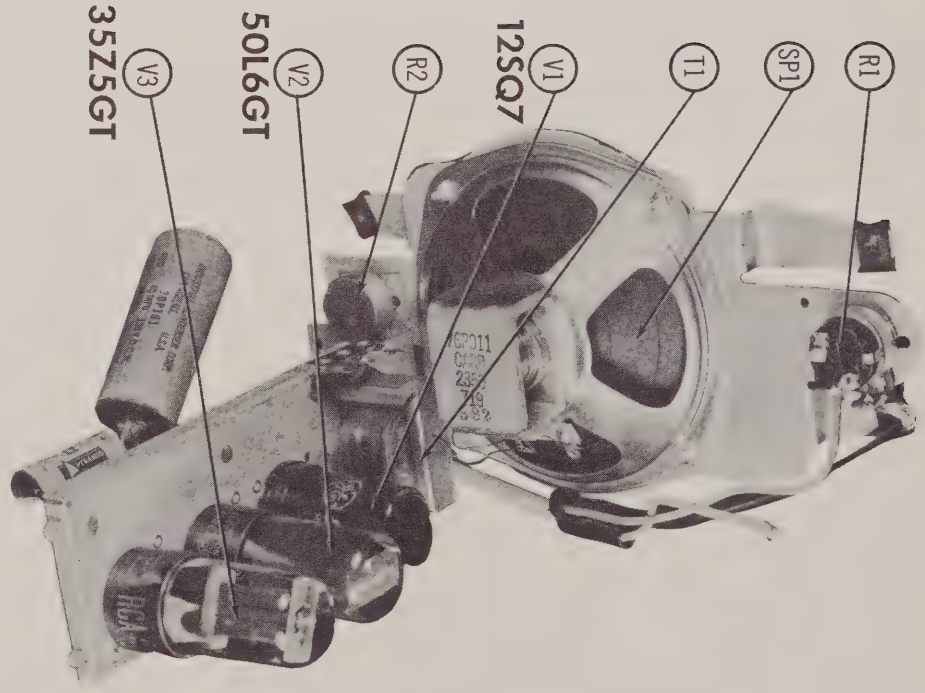
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WEBCOR PART No.	IRC PART No.	
R3	4.7Meg	½		BTS-4.7Meg	
R4	470KΩ	½		BTS-470K	
R5	470KΩ	½		BTS-470K	
R6	150Ω	½		BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WEBCOR PART No.	IRC PART No.	
R7	4700Ω	½		BTS-4700	
R8	220Ω	½		BTS-220	
R9	27Ω	½			
R10	135Ω	5			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		WEBCOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.16KΩ	3.2Ω	162Ω	.71Ω SEC.2 12.8Ω	67P018					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	WEBCOR PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.2Ω	76P011	ST-105 Mod. P5-X	5A07	

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA							REMARKS
	WEBCOR PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-C-J	A-1 A-3	WC24	A53MG A52A	46-0T	0-1 0-3	

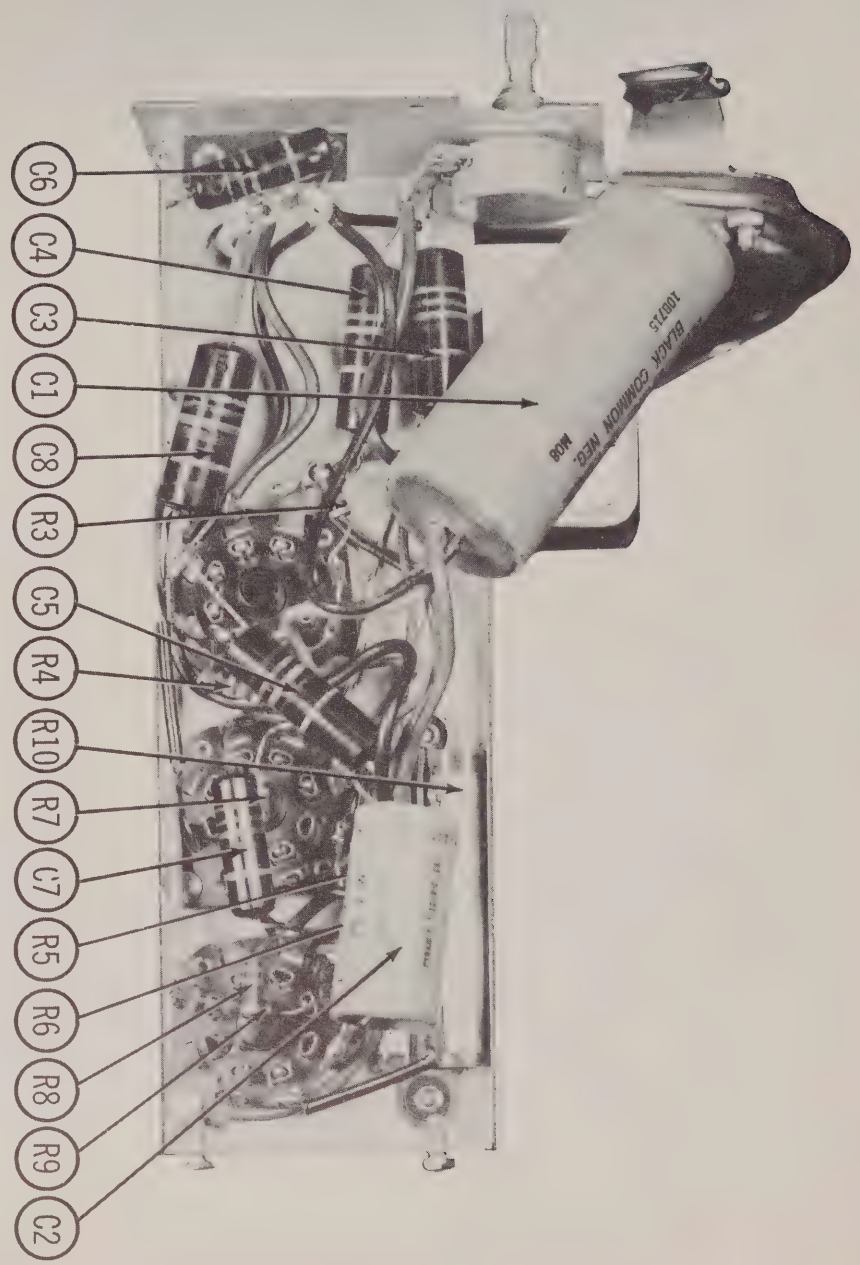
ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THEIR RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

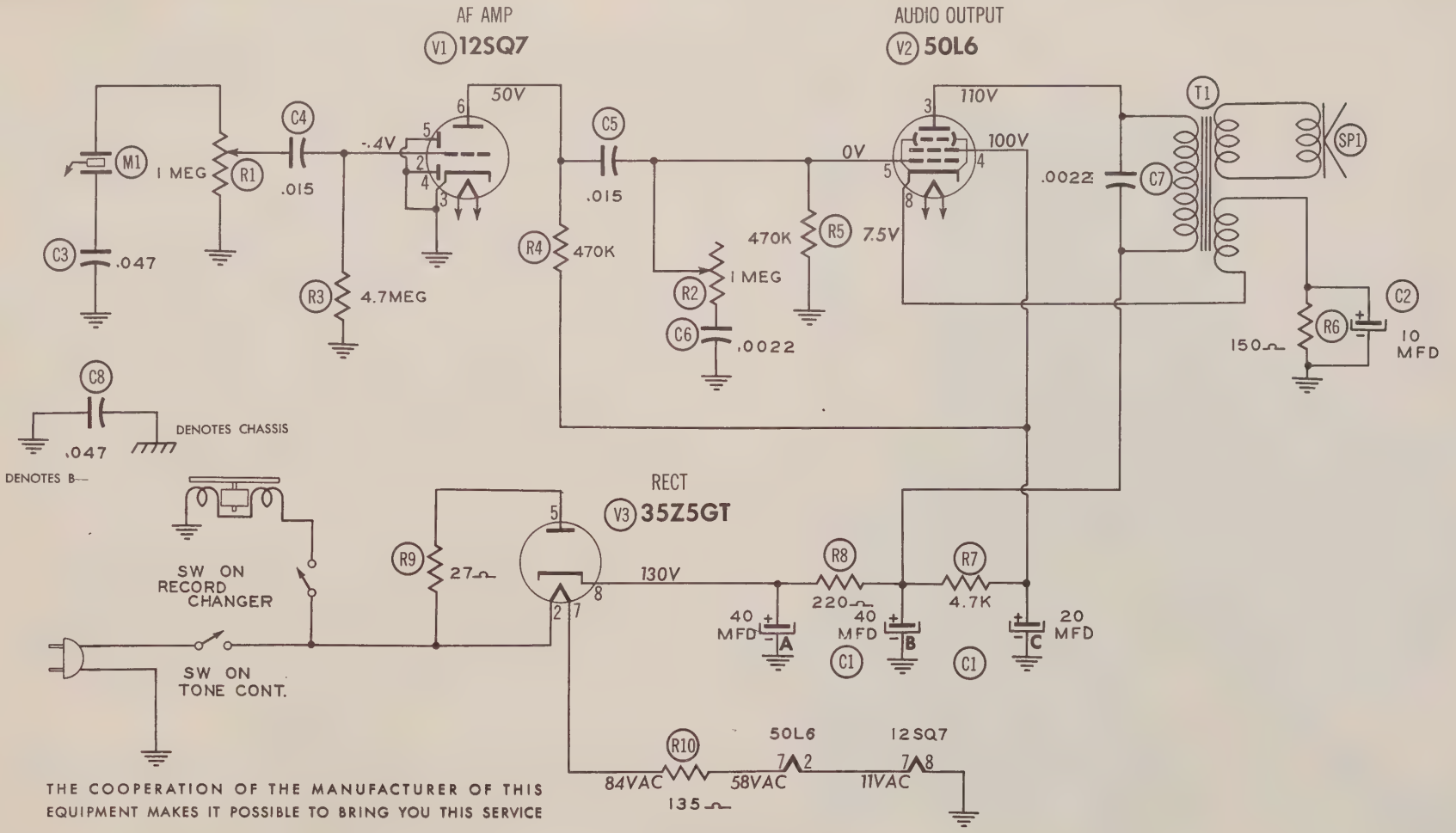
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	WEBCOR PART No.	WALCO PART No.	JENSEN PART No.	
M2		W-5MGS or W-5MGA and W-5S or W-5A	A-75LP or A-85LP and A-75 or A-85	

CHASSIS—BOTTOM VIEW



WEBCOR
MODEL B-123-1



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SQ7	INF	4.7Meg	0Ω	0Ω	0Ω	† 475KΩ	12Ω	0Ω
V 2	50L6	INF	12Ω	† 382Ω	†4.9KΩ	470KΩ	150Ω	60Ω	163Ω
V 3	35Z5GT	INF	230Ω	INF	† 220Ω	257Ω	0Ω	195Ω	500KΩ

† MEASURED FROM PIN 8 of V3

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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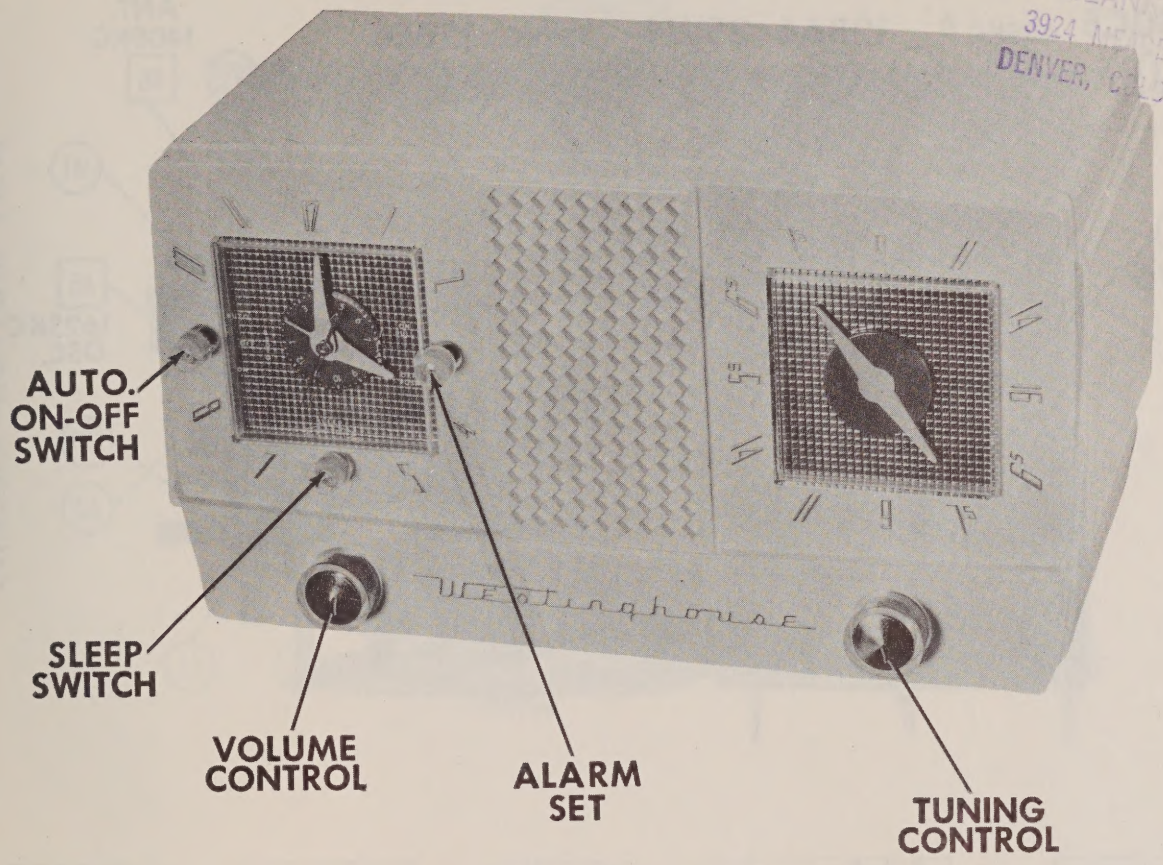
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 Volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

WESTINGHOUSE MODELS H-385T5, H-386T5 (Ch. V-2157-11)

PROPERTY OF
L. F. BLANKENSHIP
3924 [illegible] ST.
DENVER, COLORADO

WESTINGHOUSE MODELS H-385T5, H-386T5 (Ch. V-2157-11)



WESTINGHOUSE MODELS H-385T5, H-386T5 (Ch. V-2157-11)

TRADE NAME	Westinghouse Models H-385T5, H-386T5 (Ch. V-2157-11)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Sunbury, Pa.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (FIVE)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det. -AVC-AF Amp., 50C5 Audio Output, 35 W4 Rectifier.
POWER SUPPLY	105-120 Volts AC-60 Cycles — RATING .27 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screw driver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to antenna stator of tuning gang Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	"	"	1625KC	"	"	A5	"
3.	"	Loop	1400KC	Tune to 1400KC Signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		WESTINGHOUSE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	WESTINGHOUSE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	V-9991	PRS150/50-50		EDL5515		TCD49	TVA-2453	Red
B	50	150								Orange
C2	.05	200	RCP10W2503M	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3A	220									
B	.002									
C	.005		♦V-10789-1		♦PC-150		♦1408-01		♦103C4	
D	250									
E										
C4	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C5	.047	400	V-10157-4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C6	.05	200	RCP10W2503M	P288-05	DF-503	PJ2S5		PT415	2TM-S5	

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B, R5C are combined in one unit.
When replacing items separately, C3D, and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WESTINGHOUSE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	V-9993-9	Q13-133	AG-60-Z	BSK-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R2	22KΩ	½	RC20AE223M	BTS-22K	
R3	3.3Meg	½	RC20AE335M	BTS-3.3Meg	
R4	68Ω	½	RC20AE680M	BTS-68	
R5A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	♦V-10789-1	BTS-470K	
C	470KΩ	½		BTS-470K	

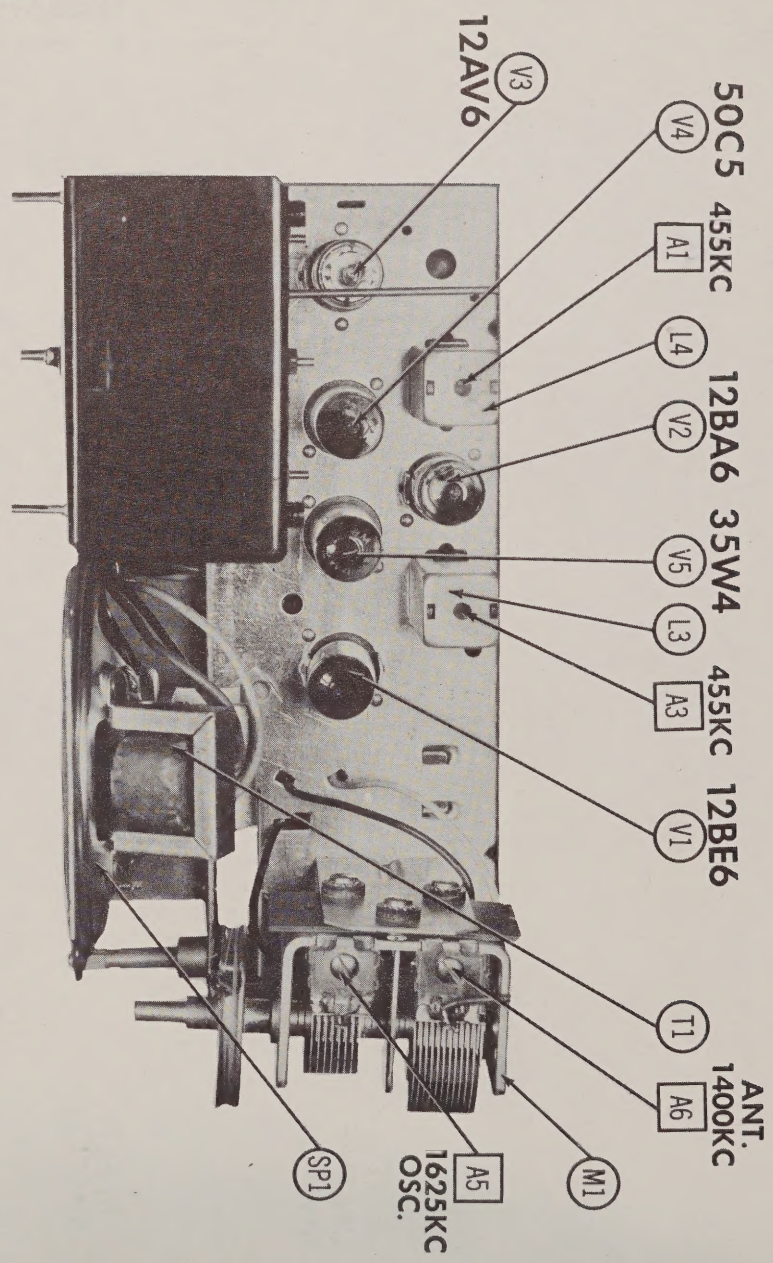
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R6	150Ω	½	RC20AE151M	BTS-150	
R7	1500Ω	1	RC30AE152M	BTA-1500	
R8	22Ω	1	RC30AE220M		

♦ Items R5A, R5B, R5C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		WESTINGHOUSE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2KΩ	3.3Ω	204Ω tap @ 9.8Ω	.85Ω	Part of Spkr.		A-3031			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

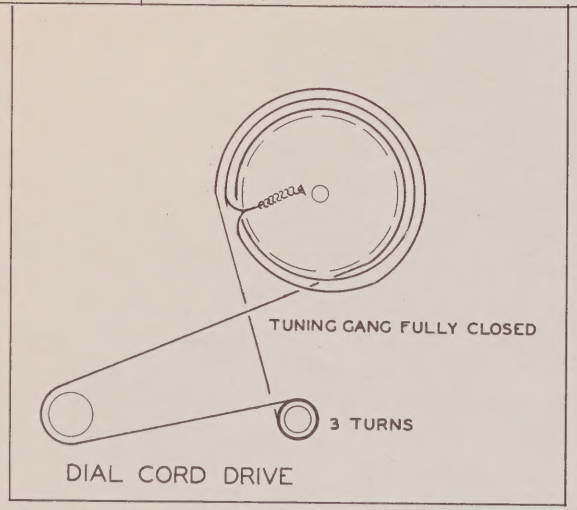
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	WESTINGHOUSE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	V-10079-2	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

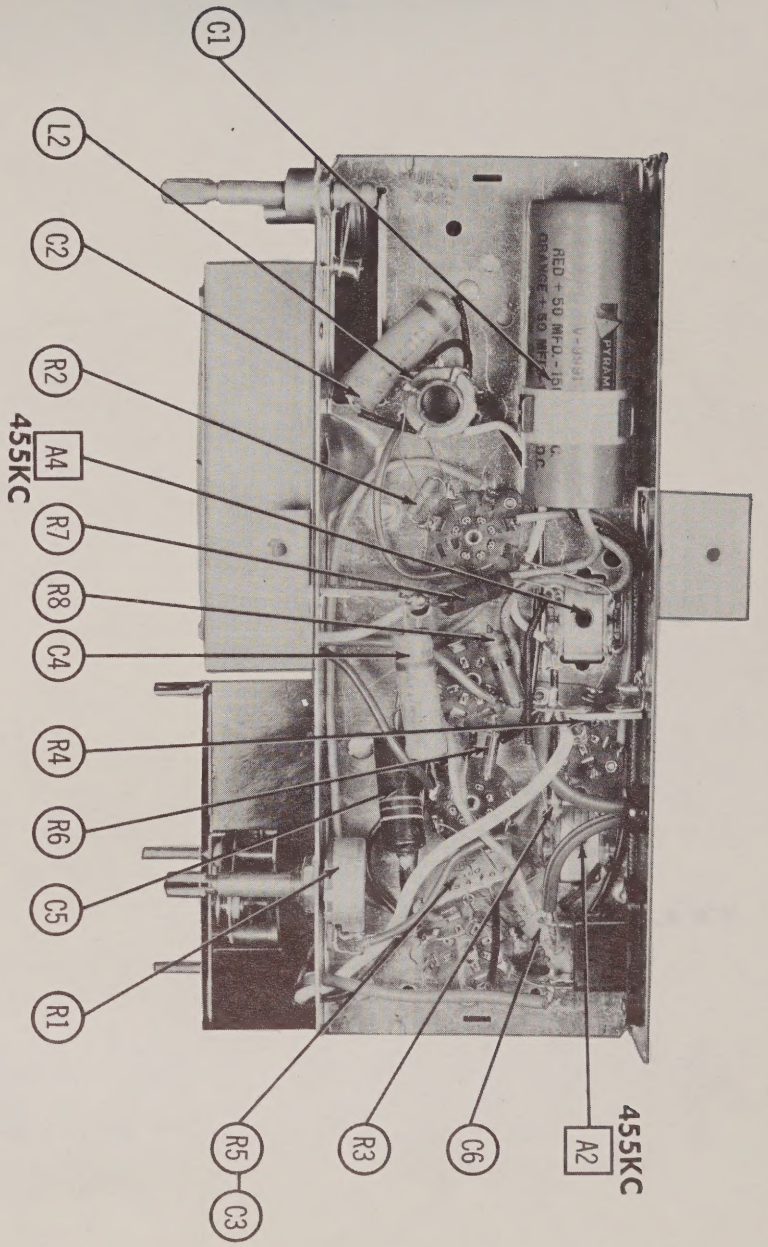
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	WESTINGHOUSE PART No.	MILLER PART No.	MEISSNER PART No.	
L1	Loop Ant.	3.2Ω		V-10785-4			
L2	Osc. Coil	1.2Ω	12.5Ω	V-9992			
L3	Input IF	17Ω	17Ω	V-10945-1	12-C1	16-6758	
L4	Output IF	17Ω	17Ω	V-10945-1	12-C2	16-6758	

MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M1	Tuning Capacitor	V-11508-1	14-390, 16-110MMF
	Cabinet	V-1290-1	Green, Model H-385T5
	Cabinet	V-1290-2	Ivory, Model H-386T5
	Background (Dial)	V-11528-1	
	Pointer	V-11574-1	
	Insert	V-11572-1	Clock Shield
	Insert	V-11572-2	Radio Shield
	Knob	V-10009-5	Volume, Tuning (2 Used)
	Knob	V-11573-1	Clock (3 Used)

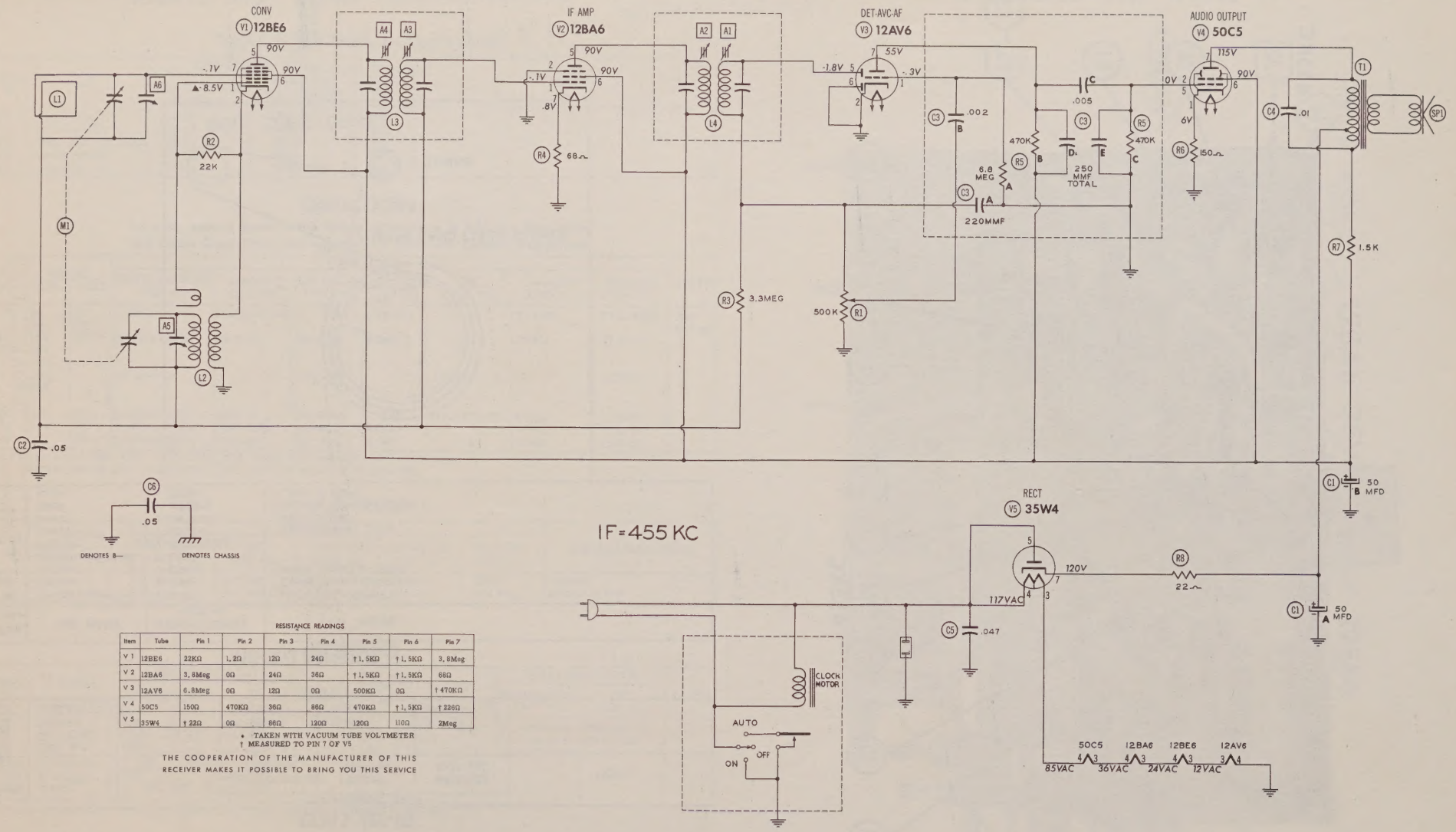


CHASSIS—BOTTOM VIEW



WESTINGHOUSE
MODEL H-385T5 (Ch. V-2157-11)

WESTINGHOUSE
MODEL H-385T5 (Ch. V-2157-11)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1, 2Ω	12Ω	24Ω	† 1, 5KΩ	† 1, 5KΩ	3, 8Meg
V 2	12BA6	3, 8Meg	0Ω	24Ω	36Ω	† 1, 5KΩ	† 1, 5KΩ	68Ω
V 3	12AV6	6.8Meg	0Ω	12Ω	0Ω	500KΩ	0Ω	† 470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	† 1, 5KΩ	† 226Ω
V 5	35W4	† 22Ω	0Ω	86Ω	120Ω	120Ω	110Ω	2Meg

* TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED TO PIN 7 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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204-13

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.